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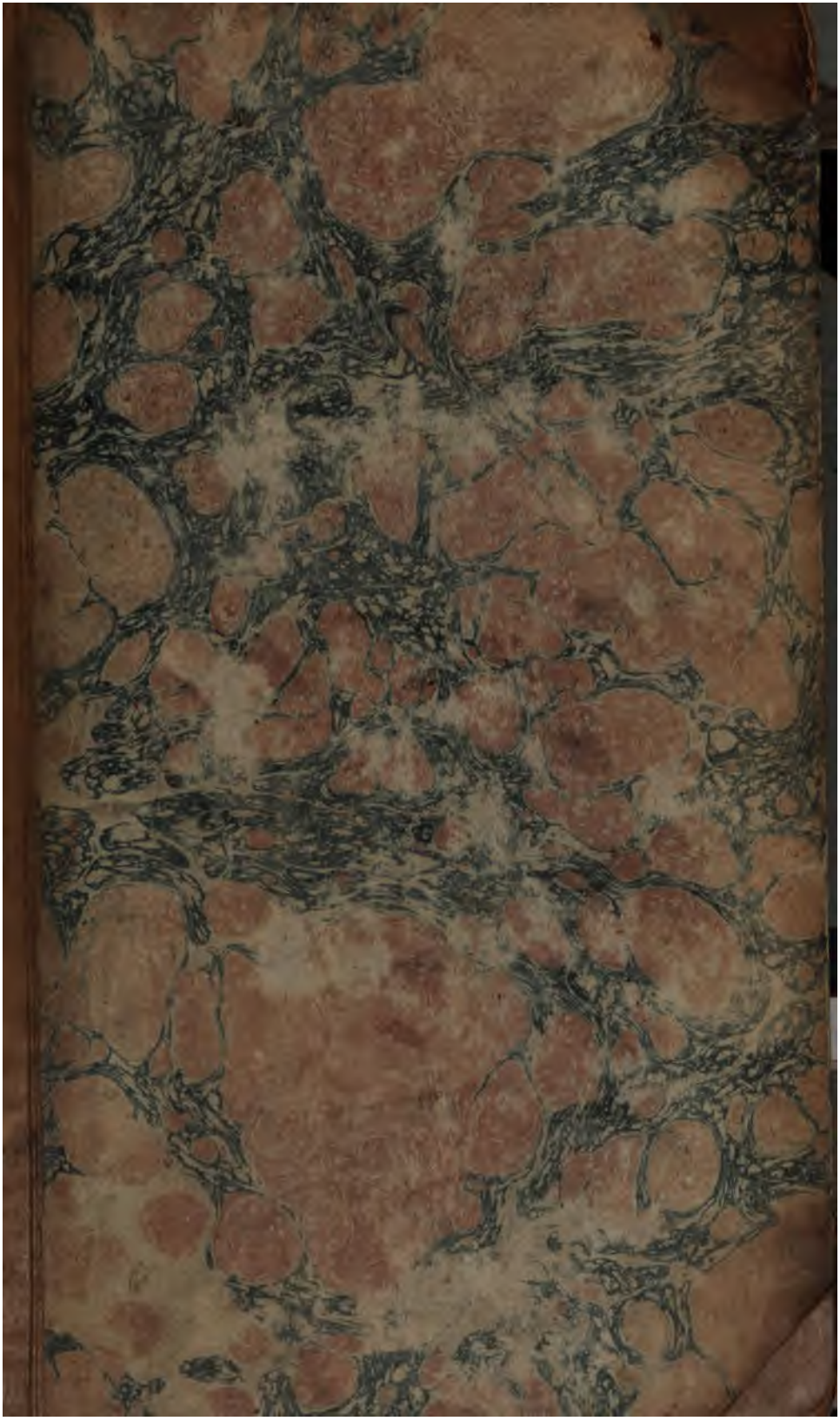

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MEDICAL INQUIRIES

AND

OBSERVATIONS.

BY BENJAMIN RUSH, M. D.

PROFESSOR OF THE INSTITUTES AND PRACTICE OF MEDICINE, AND OF CLINICAL PRACTICE, IN THE UNIVERSITY OF PENNSYLVANIA.

IN FOUR VOLUMES.

VOL. I.

THE SECOND EDITION,

REVISED AND ENLARGED BY THE AUTHOR.

PHILADELPHIA,

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PREFACE.

IN this second edition of the following Medical Inquiries and Observations, the reader will perceive many additions, some omissions, and a few alterations.

A number of facts have been added to the Inquiry into the Effects of Ardent Spirits upon the Body and Mind, and to the Observations upon the Tetanus, Cynanche Trachealis, and Old Age, in the first volume; also to the Observations upon Dropsies, Pulmonary Consumption, and Hydrophobia, contained in the second volume.

The Lectures upon Animal Life, which were published, a few years ago, in a pam-

phlet, have received no other additions than a few notes.

The phænomena of fever have not only received a new title, but several new terms have been adopted in detailing them, chiefly to remove the mistake into which the use of Dr. Brown's terms had led some of the author's readers, respecting his principles. A new order has likewise been given, and some new facts added, to the inquiry upon this subject.

In the Account of the Yellow Fever of 1793, many documents, interesting to the public at the time of their first publication, are omitted; and many of the facts and observations, which related to the origin of the fevers of 1794 and 1797, now form a part of a separate inquiry upon that subject, in the fourth volume.

The histories of the yellow fever as epidemics, and of its sporadic cases, have been published in the order in which they have ap-

peared in Philadelphia, to show the influence of the weather upon it, and the impropriety and danger of applying the same remedies for the same epidemic, in different and even successive seasons. The records of the first cases of yellow fever, which have appeared in each of the twelve years that have been noticed, are intended further to show the inefficacy of all the means, at present employed, to prevent its future recurrence.

In the fourth volume, the reader will find a retraction of the author's former opinion of the yellow fever's spreading by contagion. He begs forgiveness of the friends of science and humanity, if the publication of that opinion has had any influence in increasing the misery and mortality attendant upon that disease. Indeed, such is the pain he feels, in recollecting that he ever entertained or propagated it, that it will long, and perhaps always, deprive him of the pleasure he might otherwise have derived from a review of his attempts to fulfil the public duties of his profession.

Considerable additions are made to the facts and arguments in favour of the domestic origin of the yellow fever, and to the Defence of Blood-letting.

The Account of the Means of Preventing the Usual Forms of Summer and Autumnal Disease, appears for the first time in this edition of the author's Inquiries. Part of the facts intended to prove the yellow fever not to be contagious, were published in the sixth volume of the New-York Medical Repository. The reader will perceive, among many additions to them, answers to all the arguments usually employed to defend the contrary opinion.

The Inquiry into the Comparative State of Medicine, in Philadelphia, between the years 1760 and 1766, and 1805, was delivered, in the form of an oration, before the Medical Society of Philadelphia, on the 18th of February, 1804. Some things have been omitted, and a few added, in the form in which it is now offered to the public.

If this edition of Medical Inquiries and Observations should be less imperfect than the former, the reader is requested to ascribe it to the author having profited by the objections he encouraged his pupils to make to his principles, in their inaugural dissertations, and in conversation; and to the many useful facts which have been communicated to him by his medical brethren, whose names have been mentioned in the course of the work.

For the departure, in the modes of practice adopted or recommended in these Inquiries, from those which time and experience have sanctioned, in European and in East and West-Indian countries, the author makes the same defence of himself, that Dr. Baglivi made, near a century ago, of his modes of practice in Rome. "*Vivo et scribo in aere Romano*," said that illustrious physician. The author has lived and written in the climate of Pennsylvania, and in the city of Philadelphia.

November 18*th*, 1805.

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AN INQUIRY

INTO THE

NATURAL HISTORY OF MEDICINE

AMONG THE

INDIANS OF NORTH-AMERICA;

AND A

COMPARATIVE VIEW

OF THEIR

DISEASES AND REMEDIES WITH THOSE OF CIVILIZED NATIONS.

Read before the AMERICAN PHILOSOPHICAL SOCIETY, held at PHILADELPHIA, on the 4th of February, 1774.

AN INQUIRY, &c.

GENTLEMEN*,

I RISE with peculiar diffidence to address you upon this occasion, when I reflect upon the entertainment you proposed to yourselves from the eloquence of that learned member, Mr. CHARLES THOMPSON, whom your suffrages appointed to this honour after the delivery of the last anniversary oration. Unhappily for the interests of science, his want of health has not permitted him to comply with your appointment. I beg, therefore, that you would forget, for a while, the abilities necessary to execute this task with propriety, and listen with candour to the efforts of a member, whose attachment to the society was the only qua-

* This INQUIRY was the subject of an Anniversary Oration. The style of an oration is therefore preserved in many parts of it.

lification that entitled him to the honour of your choice.

The subject I have chosen for this evening's entertainment, is " An inquiry into the natural " history of medicine among the Indians in North- " America, and a comparative view of their dis- " eases and remedies, with those of civilized na- " tions." You will readily anticipate the difficulty of doing justice to this subject. How shall we distinguish between the original diseases of the Indians and those contracted from their intercourse with the Europeans? By what arts shall we persuade them to discover their remedies? And lastly, how shall we come at the knowledge of facts in that cloud of errors, in which the credulity of the Europeans, and the superstition of the Indians, have involved both their diseases and remedies? These difficulties serve to increase the importance of our subject. If I should not be able to solve them, perhaps I may lead the way to more successful endeavours for that purpose.

I shall first limit the tribes of Indians who are to be the objects of this inquiry, to those who inhabit that part of North-America which extends from the 30th to the 60th degree of latitude. When we exclude the Esquimaux, who inhabit

the shores of Hudson's bay, we shall find a general resemblance in the colour, manners, and state of society, among all the tribes of Indians who inhabit the extensive tract of country above-mentioned.

Civilians have divided nations into savage, barbarous, and civilized. The savage live by fishing and hunting; the barbarous, by pasturage or cattle; and the civilized, by agriculture. Each of these is connected together in such a manner, that the whole appear to form different parts of a circle. Even the manners of the most civilized nations partake of those of the savage. It would seem as if liberty and indolence were the highest pursuits of man; and these are enjoyed in their greatest perfection by savages, or in the practice of customs which resemble those of savages.

The Indians of North-America partake chiefly of the manner of savages. In the earliest accounts we have of them, we find them cultivating a spot of ground. The maize is an original grain among them. The different dishes of it which are in use among the white people still retain Indian names.

It will be unnecessary to show that the Indians live in a state of society adapted to all the exigencies of their mode of life. Those who look for

the simplicity and perfection of the state of nature, must seek it in systems, as absurd in philosophy, as they are delightful in poetry.

Before we attempt to ascertain the number or history of the diseases of the Indians, it will be necessary to inquire into those customs among them which we know influence diseases. For this purpose I shall,

First, Mention a few facts which relate to the birth and treatment of their children.

Secondly, I shall speak of their diet.

Thirdly, Of the customs which are peculiar to the sexes, and,

Fourthly, Of those customs which are common to them both*.

* Many of the facts contained in the Natural History of Medicine among the Indians in this Inquiry, are taken from La Hontan and Charlevoix's histories of Canada; but the most material of them are taken from persons who had lived or travelled among the Indians. The author acknowledges himself indebted in a particular manner to Mr. Edward Hand, surgeon in the 18th regiment, afterwards brigadier-general in the army of the United States, who,

I. Of the birth and treatment of their children.

Much of the future health of the body depends upon its original stamina. A child born of healthy parents always brings into the world a system formed by nature to resist the causes of diseases. The treatment of children among the Indians, tends to secure this hereditary firmness of constitution. Their first food is their mother's milk. To harden them against the action of heat and cold (the natural enemies of health and life among the Indians) they are plunged every day into cold water. In order to facilitate their being moved from place to place, and at the same time to preserve their shape, they are tied to a board, where they lie on their backs for six, ten, or eighteen months. A child generally sucks its mother till it is two years old, and sometimes longer. It is easy to conceive how much vigour their bodies must acquire from this simple, but wholesome nourishment. The appetite we sometimes observe in children for flesh is altogether artificial. The peculiar irritability of the system in infancy forbids stimulating aliment of all kinds. Nature never calls for animal food till she has provided the child

during several years' residence at Fort Pitt, directed his inquiries into their customs, diseases, and remedies, with a success that does equal honour to his ingenuity and diligence.

with those teeth which are necessary to divide it. I shall not undertake to determine how far the wholesome quality of the mother's milk is increased by her refusing the embraces of her husband, during the time of giving suck.

II. The diet of the Indians is of a mixed nature, being partly animal and partly vegetable. Their animals are wild, and therefore easy of digestion. As the Indians are naturally more disposed to the indolent employment of fishing than hunting, in summer, so we find them living more upon fish than land animals, in that season of the year.—Their vegetables consist of roots and fruits, mild in themselves, or capable of being made so by the action of fire. Although the interior parts of our continent abound with salt springs, yet I cannot find that the Indians used salt in their diet, till they were instructed to do so by the Europeans. The small quantity of fixed alkali contained in the ashes on which they roasted their meat, could not add much to its stimulating quality. They preserve their meat from putrefaction, by cutting it into small pieces, and exposing it in summer to the sun, and in winter to the frost. In the one case its moisture is dissipated, and in the other so frozen, that it cannot undergo the putrefactive process. In dressing their meat, they are careful to preserve

its juices. They generally prefer it in the form of soups. Hence we find, that among them the use of the spoon, preceded that of the knife and fork. They take the same pains to preserve the juice of their meat when they roast it, by turning it often. The efficacy of this animal juice, in dissolving meat in the stomach, has not been equalled by any of those sauces or liquors which modern luxury has mixed with it for that purpose.

The Indians have no set time for eating, but obey the gentle appetites of nature as often as they are called by them. After whole days spent in the chace or in war, they often commit those excesses in eating, to which long abstinence cannot fail of prompting them. It is common to see them spend three or four hours in satisfying their hunger. This is occasioned not more by the quantity they eat, than by the pains they take in masticating it. They carefully avoid drinking water in their marches, from an opinion that it lessens their ability to bear fatigue.

III. We now come to speak of those customs which are peculiar to the sexes. And, first, of those which belong to the WOMEN. They are doomed by their husbands to such domestic labour as gives a firmness to their bodies, bordering upon

the masculine. Their menses seldom begin to flow before they are eighteen or twenty years of age, and generally cease before they are forty. They have them in small quantities, but at regular intervals. They seldom marry till they are about twenty. The constitution has now acquired a vigour, which enables it the better to support the convulsions of child-bearing. This custom likewise guards against a premature old age. Doctor Bancroft ascribes the haggard looks, the loose hanging breasts, and the prominent bellies of the Indian women at Guiana, entirely to their bearing children too early*. Where marriages are unfruitful (which is seldom the case) a separation is obtained by means of an easy divorce; so that they are unacquainted with the disquietudes which sometimes arise from barrenness. During pregnancy, the women are exempted from the more laborious parts of their duty: hence miscarriages rarely happen among them. Nature is their only midwife. Their labours are short, and accompanied with little pain. Each woman is delivered in a private cabin, without so much as one of her own sex to attend her. After washing herself in cold water, she returns in a few days to her usual employments; so that she knows nothing of

* Natural History of Guiana.

those accidents which proceed from the carelessness or ill management of midwives; or those weaknesses which arise from a month's confinement in a warm room. It is remarkable that there is hardly a period in the interval between the eruption and the ceasing of the menses, in which they are not pregnant, or giving suck. This is the most natural state of the constitution during that interval; and hence we often find it connected with the best state of health, in the women of civilized nations.

The customs peculiar to the Indian MEN, consist chiefly in those employments which are necessary to preserve animal life, and to defend their nation. These employments are hunting and war, each of which is conducted in a manner that tends to call forth every fibre into exercise, and to ensure them the possession of the utmost possible health. In times of plenty and peace, we see them sometimes rising from their beloved indolence, and shaking off its influence by the salutary exercises of dancing and swimming. The Indian men seldom marry before they are thirty years of age: they no doubt derive considerable vigour from this custom; for while they are secured by it from the enervating effects of the premature dalliance of love, they may insure more certain fruitfulness to

their wives, and entail more certain health upon their children. Tacitus describes the same custom among the Germans, and attributes to it the same good effects. "Sera juvenum venus, eoque "inexhausta pubertas; nec virgines festinantur; "eadem juventa, similis proceritas, pares vali- "dique miscentur; ac robora parentum liberi "referunt*."

Among the Indian men, it is deemed a mark of heroism to bear the most exquisite pain without complaining; upon this account they early inure themselves to burning part of their bodies with fire, or cutting them with sharp instruments. No young man can be admitted to the honours of manhood or war, who has not acquitted himself well in these trials of patience and fortitude. It is easy to conceive how much this contributes to give a tone to the nervous system, which renders it less subject to the occasional causes of diseases.

IV. We come now to speak of those customs which are common to both sexes: these are

* Cæsar, in his history of the Gallic war, gives the same account of the ancient Germans. His words are "Qui "diutissimi impuberes permanserunt, maximam inter suos "ferunt laudem: hoc ali staturam, ali vires, nervasque con- "firmari putant." Lib. vi. xxi.

PAINTING, and the use of the COLD BATH. The practice of anointing the body with oil is common to the savages of all countries; in warm climates it is said to promote longevity, by checking excessive perspiration. The Indians generally use bear's grease mixed with a clay, which bears the greatest resemblance to the colour of their skins. This pigment serves to lessen the sensibility of the extremities of the nerves; it moreover fortifies them against the action of those exhalations, which we shall mention hereafter, as a considerable source of their diseases. The COLD BATH likewise fortifies the body, and renders it less subject to those diseases which arise from the extremes and vicissitudes of heat and cold. We shall speak hereafter of the Indian manner of using it.

It is a practice among the Indians never to drink before dinner, when they work or travel. Experience teaches, that filling the stomach with cold water in the forenoon, weakens the appetite, and makes the system more sensible of heat and fatigue.

The state of society among the Indians excludes the influence of most of those passions which disorder the body. The turbulent effects of anger are concealed in deep and lasting resentments.

Envy and ambition are excluded by their equality of power and property. Nor is it necessary that the perfections of the whole sex should be ascribed to one, to induce them to marry. "The weakness of love (says Dr. Adam Smith) which is so much indulged in ages of humanity and politeness, is regarded among savages as the most unpardonable effeminacy. A young man would think himself disgraced for ever, if he showed the least preference of one woman above another, or did not express the most complete indifference, both about the time when, and the person to whom, he was to be married*." Thus are they exempted from those violent or lasting diseases, which accompany the several stages of such passions in both sexes among civilized nations.

It is remarkable that there are no deformed Indians. Some have suspected, from this circumstance, that they put their deformed children to death; but nature here acts the part of an unnatural mother. The severity of the Indian manners destroy them†.

* Theory of Moral Sentiments.

† Since the intercourse of the white people with the Indians, we find some of them deformed in their limbs. This deformity, upon inquiry, appears to be produced by those

From a review of the customs of the Indians, we need not be surprised at the stateliness, regularity of features, and dignity of aspect by which they are characterized. Where we observe these among ourselves, there is always a presumption of their being accompanied with health, and a strong constitution. The circulation of the blood is more languid in the Indians, than in persons who are in the constant exercise of the habits of civilized life. Out of eight Indian men whose pulses I once examined at the wrists, I did not meet with one in whom the artery beat more than sixty strokes in a minute.

The marks of old age appear more early among Indian, than among civilized nations.

Having finished our inquiry into the physical customs of the Indians, we shall now proceed to inquire into their diseases.

A celebrated professor of anatomy has asserted, that we could not tell, by reasoning *à priori*, that the body was mortal, so intimately woven with its texture are the principles of life. Lord Bacon declares, that the only cause of death which is na-

accidents, quarrels, &c. which have been introduced among them by spiritous liquors.

tural to man, is that from old age; and complains of the imperfection of physic, in not being able to guard the principle of life, until the whole of the oil that feeds it is consumed. We cannot as yet admit this proposition of our noble philosopher. In the inventory of the grave in every country, we find more of the spoils of youth and manhood than of age. This must be attributed to moral as well as physical causes.

We need only recollect the custom among the Indians, of sleeping in the open air in a variable climate; the alternate action of heat and cold upon their bodies, to which the warmth of their cabins exposes them; their long marches; their excessive exercise; their intemperance in eating, to which their long fasting and their public feasts naturally prompt them; and, lastly, the vicinity of their habitations to the banks of rivers, in order to discover the empire of diseases among them in every stage of their lives. They have in vain attempted to elude the general laws of mortality, while their mode of life subjects them to these remote, but certain causes of diseases.

From what we know of the action of these powers upon the human body, it will hardly be necessary to appeal to facts to determine that FEVERS

constitute the only diseases among the Indians. These fevers are occasioned by the insensible qualities of the air. Those which are produced by cold and heat are of the inflammatory kind, such as pleurisies, peripneumonies, and rheumatisms. Those which are produced by the insensible qualities of the air, or by putrid exhalations, are intermitting, remitting, inflammatory, and malignant, according as the exhalations are combined with more or less heat or cold. The DYSENTERY (which is an Indian disease) comes under the class of fevers. It appears to be the febris introversa of Dr. Sydenham.

The Indians are subject to ANIMAL and VEGETABLE POISONS. The effects of these upon the body, are in some degree analogous to the exhalations we have mentioned. When they do not bring on sudden death, they produce, according to their force, either a common inflammatory, or a malignant fever.

The SMALL POX and the VENEREAL DISEASE were communicated to the Indians of North-America by the Europeans. Nor can I find that they were ever subject to the SCURVY. Whether this was obviated by their method of preserving their flesh, or by their mixing it at all times with vegetables, I shall not undertake to determine. Their

peculiar customs and manners seem to have exempted them from this, as well as from the common diseases of the skin.

I have heard of two or three cases of the GOUT among the Indians, but it was only among those who had learned the use of rum from the white people. A question naturally occurs here, and that is, why does not the gout appear more frequently among that class of people, who consume the greatest quantity of rum among ourselves? To this I answer, that the effects of this liquor upon those enfeebled people, are too sudden and violent, to admit of their being thrown upon the extremities; as we know them to be among the Indians. They appear only in visceral obstructions, and a complicated train of chronic diseases. Thus putrid miasmata are sometimes too strong to bring on a fever, but produce instant debility and death. The gout is seldom heard of in Russia, Denmark, or Poland. Is this occasioned by the vigour of constitution peculiar to the inhabitants of those northern countries? or is it caused by their excessive use of spirituous liquors, which produce the same chronic complaints among them, which we said were common among the lower class of people in this country? The similarity of their diseases makes the last of these suppositions the

most probable. The effects of wine, like tyranny in a well formed government, are felt first in the extremities; while spirits, like a bold invader, seize at once upon the vitals of the constitution.

After much inquiry, I have not been able to find a single instance of FATUITY among the Indians, and but few instances of MELANCHOLY and MADNESS; nor can I find any accounts of diseases from WORMS among them. Worms are common to most animals; they produce diseases only in weak, or increase them in strong constitutions*. Hence they have no place in the nosological systems of physic. Nor is DENTITION accompanied by disease among the Indians. The facility with which the healthy children of healthy parents cut their teeth among civilized nations, gives us reason to conclude that the Indian children never suffer from this quarter.

The Indians appear moreover to be strangers to diseases and pains in the teeth.

* Indian children are not exempted from worms. It is common with the Indians, when a fever in their children is ascribed by the white people to worms (from their being discharged occasionally in their stools), to say, "the fever "makes the worms come, and not the worms the fever."

The employments of the Indians subject them to many accidents; hence we sometimes read of WOUNDS, FRACTURES, and LUXATIONS among them.

Having thus pointed out the natural diseases of the Indians, and shown what diseases are foreign to them, we may venture to conclude, that FEVERS, OLD AGE, CASUALTIES, and WAR are the only natural outlets of human life. War is nothing but a disease; it is founded in the imperfection of political bodies, just as fevers are founded on the weakness of the animal body. Providence in these diseases seems to act like a mild legislature, which mitigates the severity of death, by inflicting it in a manner the least painful, upon the whole, to the patient and the survivors.

Let us now inquire into the REMEDIES of the Indians. These, like their diseases, are simple, and few in number. Among the first of them we shall mention the POWERS OF NATURE. Fevers, we said formerly, constituted the chief of the diseases among the Indians; they are likewise, in the hands of nature, the principal instruments to remove the evils which threaten her dissolution; but the event of these efforts of nature, no doubt, soon convinced the Indians of the danger of trust-

ing her in all cases; and hence, in the earliest accounts we have of their manners, we read of persons who were intrusted with the office of physicians.

It will be difficult to find out the exact order in which the Indian remedies were suggested by nature or discovered by art; nor will it be easy to arrange them in proper order. I shall, however, attempt it, by reducing them to NATURAL and ARTIFICIAL.

To the class of NATURAL REMEDIES belongs the Indian practice of abstracting from their patients all kinds of stimulating aliment. The compliance of the Indians with the dictates of nature, in the early stage of a disease, no doubt, prevents, in many cases, their being obliged to use any other remedy. They follow nature still closer, in allowing their patients to drink plentifully of cold water; this being the only liquor a patient calls for in a fever.

Sweating is likewise a natural remedy. It was probably suggested by observing fevers to be terminated by it. I shall not inquire how far these sweats are essential to the crisis of a fever. The Indian mode of procuring this evacuation is as fol-

lows: the patient is confined in a close tent, or wigwam, over a hole in the earth, in which a red hot stone is placed; a quantity of water is thrown upon this stone, which instantly involves the patient in a cloud of vapour and sweat; in this situation he rushes out, and plunges himself into a river, from whence he retires to his bed. If the remedy has been used with success, he rises from his bed in four and twenty hours, perfectly recovered from his indisposition. This remedy is used not only to cure fevers, but remove that uneasiness which arises from fatigue of body.

A third natural remedy among the Indians, is PURGING. The fruits of the earth, the flesh of birds, and other animals feeding upon particular vegetables, and, above all, the spontaneous efforts of nature, early led the Indians to perceive the necessity and advantages of this evacuation.

VOMITS constitute their fourth natural remedy. They were probably, like the former, suggested by nature, and accident. The ipecacuanha is one of the many roots they employ for that purpose.

The ARTIFICIAL REMEDIES made use of by the Indians, are BLEEDING, CAUSTICS, and ASTRINGENT medicines. They confine bleeding

entirely to the part affected. To know that opening a vein in the arm, or foot, would relieve a pain in the head or side, supposes some knowledge of the animal economy, and therefore marks an advanced period in the history of medicine.

Sharp stones and thorns are the instruments they use to procure a discharge of blood.

We have an account of the Indians using something like a POTENTIAL CAUSTIC, in obstinate pains. It consists of a piece of rotten wood called *punk*, which they place upon the part affected, and afterwards set it on fire: the fire gradually consumes the wood, and its ashes burn a hole in the flesh.

The undue efforts of nature, in those fevers which are connected with a diarrhœa, or dysentery, together with those hemorrhages to which their mode of life exposed them, necessarily led them to an early discovery of some ASTRINGENT VEGETABLES. I am uncertain whether the Indians rely upon astringent, or any other vegetables, for the cure of the intermitting fever. This disease among them probably requires no other remedies than the cold bath, or cold air. Its greater obstinacy, as well as frequency, among

ourselves, must be sought for in the greater feebleness of our constitutions, and in that change which our country has undergone, from meadows, mill-dams, and the cutting down of woods; whereby morbid exhalations have been multiplied, and their passage rendered more free, through every part of country.

This is a short account of the remedies of the Indians. If they are simple, they are like their eloquence, full of strength; if they are few in number, they are accommodated, as their languages are to their ideas, to the whole of their diseases.

We said, formerly, that the Indians were subject to ACCIDENTS, such as wounds, fractures, and the like. In these cases, nature performs the office of a surgeon. We may judge of her qualifications for this office, by observing the marks of wounds and fractures, which are sometimes discovered on wild animals. But further, what is the practice of our modern surgeons in these cases? Is it not to lay aside plasters and ointments, and trust the whole to nature? Those ulcers which require the assistance of mercury, bark, and a particular regimen are unknown to the Indians.

The HEMORRHAGES which sometimes follow their wounds, are restrained by plunging themselves into cold water, and thereby producing a constriction upon the bleeding vessels.

Their practice of attempting to recover DROWNED PEOPLE, is irrational and unsuccessful. It consists in suspending the patient by the heels, in order that the water may flow from his mouth. This practice is founded on a belief that the patient dies from swallowing an excessive quantity of water. But modern observations teach us that drowned people die from another cause. This discovery has suggested a method of cure, directly opposite to that in use among the Indians; and has shown us that the practice of suspending by the heels is hurtful.

I do not find that the Indians ever suffer in their limbs from the action of COLD upon them. Their mokasons*, by allowing their feet to move freely, and thereby promoting the circulation of the blood, defend their lower extremities in the daytime, and their practice of sleeping with their feet near a fire, defends them from the morbid effects of cold at night. In those cases where the motion

* Indian shoes.

of their feet in their mokasons is not sufficient to keep them warm, they break the ice, and restore their warmth by exposing them for a short time to the action of cold water*.

We have heard much of their specific antidotes to the VENEREAL DISEASE. In the accounts of these anti-venereal medicines, some abatement should be made for that love of the marvellous, and of novelty, which are apt to creep into the writings of travellers and physicians. How many medicines which were once thought infallible in this disease, are now rejected from the materia medica! I have found upon inquiry that the Indians always assist their medicines in this disease, by a regimen which promotes perspiration. Should we allow that mercury acts as a specific in destroying this disease, it does not follow that it is proof against the efficacy of medicines which act more mechanically upon the body†.

* It was remarked in Canada, in the winter of the year 1759, during the war before last, that none of those soldiers who wore mokasons were frost-bitten, while few of those escaped that were much exposed to the cold who wore shoes.

† I cannot help suspecting the anti-venereal qualities of the lobelia, ceanothus and ranunculus, spoken of by Mr. Kalm, in the Memoirs of the Swedish Academy. Mr. Hand informed me, that the Indians rely chiefly upon a plentiful

There cannot be a stronger mark of the imperfect state of knowledge in medicine among the Indians, than their method of treating the SMALL-POX. We are told that they plunge themselves in cold water in the beginning of the disease, and that it often proves fatal to them.

Travellers speak in high terms of the Indian ANTIDOTES TO POISONS. We must remember that many things have been thought poisonous, which later experience hath proved to possess no unwholesome quality. Moreover, the uncertainty and variety in the operation of poisons, renders it extremely difficult to fix the certainty of the antidotes to them. How many specifics have derived their credit for preventing the hydrophobia, from persons being wounded by animals, who were not in a situation to produce that disease! If we may judge of all the Indian antidotes to poisons, by those which have fallen into our hands, we have little reason to ascribe much to them in any cases whatever.

I have heard of their performing several remarkable cures upon STIFF JOINTS, by an infusion of

use of the decoctions of the pine-trees for the cure of the venereal disease. He added, moreover, that he had often known this disease prove fatal to them.

certain herbs in water. The mixture of several herbs together in this infusion calls in question the specific efficacy of each of them. I cannot help attributing the whole success of this remedy to the great heat of the water in which the herbs were boiled, and to its being applied for a long time to the part affected. We find the same medicine to vary frequently in its success, according to its strength, or to the continuance of its application. De Haen attributes the good effects of electricity, entirely to its being used for several months.

I have met with one case upon record of their aiding nature in PARTURITION. Captain Carver gives us an account of an Indian woman in a difficult labour, being suddenly delivered in consequence of a general convulsion induced upon her system, by stopping, for a short time, her mouth and nose, so as to obstruct her breathing.

We are sometimes amused with accounts of Indian remedies for the DROPSY, EPILEPSY, COLIC, GRAVEL, and GOUT. If, with all the advantages which modern physicians derive from their knowledge in anatomy, chemistry, botany, and philosophy; if, with the benefit of discoveries communicated from abroad, as well as handed down from our ancestors, by more certain me-

thods than tradition, we are still ignorant of certain remedies for these diseases; what can we expect from the Indians, who are not only deprived of these advantages, but want our chief motive, the sense of the pain and danger of those diseases, to prompt them to seek for such remedies to relieve them? There cannot be a stronger proof of their ignorance of proper remedies for new or difficult diseases, than their having recourse to enchantment. But to be more particular; I have taken pains to inquire into the success of some of these Indians specifics, and have never heard of one well attested case of their efficacy. I believe they derive all their credit from our being ignorant of their composition. The influence of secrecy is well known in establishing the credit of a medicine. The sal seignette was supposed to be an infallible medicine for the intermitting fever, while the manufactory of it was confined to an apothecary at Rochelle; but it lost its virtues as soon as it was found to be composed of the acid of tartar and the fossil alkali. Dr. Ward's famous pill and drop ceased to do wonders in scrophulous cases, as soon as he bequeathed to the world his receipts for making them.

I foresee an objection to what has been said concerning the remedies of the Indians, drawn from

that knowledge which experience gives to a mind intent upon one subject. We have heard much of the perfection of their senses of seeing and hearing. An Indian, we are told, will discover not only a particular tribe of Indians by their footsteps, but the distance of time in which they were made. In those branches of knowledge which relate to hunting and war, the Indians have acquired a degree of perfection that has not been equalled by civilized nations. But we must remember, that medicine among them does not possess the like advantages with the arts of war and hunting, of being the *chief* object of their attention. The physician and the warrior are united in one character; to render him as able in the former as he is in the latter profession, would require an entire abstraction from every other employment, and a familiarity with external objects, which are incompatible with the wandering life of savages.

Thus have we finished our inquiry into the diseases and remedies of the Indians in North-America. We come now to inquire into the diseases and remedies of civilized nations.

Nations differ in their degrees of civilization. We shall select one for the subject of our inquiries

which is most familiar to us; I mean the British nation. Here we behold subordination and classes of mankind established by government, commerce, manufactures, and certain customs common to most of the civilized nations of Europe. We shall trace the origin of their diseases through their customs, in the same manner as we did those of the Indians.

I. It will be sufficient to name the degrees of heat, the improper aliment, the tight dresses, and the premature studies children are exposed to, in order to show the ample scope for diseases, which is added to the original defect of stamina they derive from their ancestors.

II. Civilization rises in its demands upon the health of women. Their fashions; their dress and diet; their eager pursuits and ardent enjoyment of pleasure; their indolence and undue evacuations in pregnancy; their cordials, hot regimen, and neglect, or use of art, in child-birth, are all so many inlets to disease.

Humanity would fain be silent, while philosophy calls upon us to mention the effects of interested marriages, and of disappointments in love, increased by that concealment which the tyranny

of custom has imposed upon the sex*. Each of these exaggerates the natural, and increases the number of artificial diseases among women.

III. The diseases introduced by civilization extend themselves through every class and profession among men. How fatal are the effects of idleness and intemperance among the rich, and of hard labour and penury among the poor! What pallid looks are contracted by the votaries of science from hanging over the "sickly taper!" How many diseases are entailed upon manufacturers, by the materials in which they work, and the posture of their bodies! What monkish diseases do we observe from monkish continence and monkish vices! We pass over the increase of accidents from building, sailing, riding, and the like. War, as if too slow in destroying the human species,

* "Married women are more healthy and long-lived "than single women. The registers, examined by Mr. Mu- "ret, confirm this observation; and show particularly, that "of equal numbers of single and married women between "fifteen and twenty-five years of age, more of the former "died than of the latter, in the proportion of two to one: "the consequence, therefore, of following nature must be "favourable to health among the female sex." Supplement to Price's Observations on Reversionary Payments. p. 357.

calls in a train of diseases peculiar to civilized nations. What havoc have the corruption and monopoly of provisions, a damp soil, and an unwholesome sky, made, in a few days, in an army! The achievements of British valour, at the Havannah, in the last war, were obtained at the expence of 9,000 men, 7,000 of whom perished with the West-India fever*. Even our modern discoveries in geography, by extending the empire of commerce, have likewise extended the empire of diseases. What desolation have the East and West-Indies made of British subjects! It has been found, upon a nice calculation, than only ten of a hundred Europeans, live above seven years after they arrive in the island of Jamaica.

* The modern writers upon the diseases of armies, wonder that the Greek and Roman physicians have left us nothing upon that subject. But may not *most* of the diseases of armies be produced by the different manner in which wars are carried on by the modern nations? The discoveries in geography, by extending the field of war, expose soldiers to many diseases from long voyages, and a *sudden* change of climate, which were unknown to the armies of former ages. Moreover, the form of the weapons, and the variety in the military exercises of the Grecian and Roman armies, gave a vigour to the constitution, which can never be acquired by the use of muskets and artillery.

IV. It would take up too much of our time to point out all the customs, both *physical* and *moral*, which influence diseases among both sexes. The former have engendered the seeds of diseases in the human body itself: hence the origin of catarrhs, jail and miliary fevers, with a long train of other diseases, which compose so great a part of our books of medicine. The latter likewise have a large share in producing diseases. I am not one of those modern philosophers, who derive the vices of mankind from the influence of civilization; but I am safe in asserting, that their number and malignity increase with the refinements of polished life. To prove this, we need only survey a scene too familiar to affect us: it is a bedlam; which injustice, inhumanity, avarice, pride, vanity, and ambition, have filled with inhabitants.

Thus have I briefly pointed out the customs which influence the diseases of civilized nations. It remains now that we take notice of their diseases. Without naming the many new fevers, fluxes, hemorrhages, swellings from water, wind, flesh, fat, pus, and blood; foulnesses on the skin, from cancers, leprosy, yawes, poxes, and itch; and, lastly, the gout, the hysteria, and the hypochondriasis, in all their variety of known and un-

known shapes; I shall sum up all that is necessary upon this subject, by adding, that the number of diseases which belong to civilized nations, according to Doctor Cullen's nosology, amounts to 1387; the single class of nervous diseases form 612 of this number.

Before we proceed to speak of the remedies of civilized nations, we shall examine into the abilities of NATURE in curing their diseases. We found her active and successful in curing the diseases of the Indians. Are her strength, wisdom, or benignity, equal to the increase of those dangers which threaten her dissolution among civilized nations? In order to answer this question, it will be necessary to explain the meaning of the term nature.

By nature, in the present case, I understand nothing but *physical necessity*. This at once excludes every thing like intelligence from her operations: these are all performed in obedience to the same laws which govern vegetation in plants, and the intestine motions of fossils. They are as truly mechanical as the laws of gravitation, electricity, or magnetism. A ship when laid on her broadside by a wave, or a sudden blast of wind, rises by the simple laws of her mechanism; but

suppose this ship to be attacked by fire, or a water-spout, we are not to call in question the skill of the ship-builder, if she be consumed by the one, or sunk by the other. In like manner, the Author of nature hath furnished the body with powers to preserve itself from its natural enemies; but when it is attacked by those civil foes which are bred by the peculiar customs of civilization, it resembles a company of Indians, armed with bows and arrows, against the complicated and deadly machinery of fire-arms. To place this subject in a proper light, I shall deliver a history of the operations of nature in a few of the diseases of civilized nations.

I. There are cases in which nature is still successful in curing diseases.

In fevers she still deprives us of our appetite for animal food, and imparts to us a desire for cool air and cold water.

In hemorrhages she produces a faintness, which occasions a coagulum in the open vessels; so that the further passage of blood through them is obstructed.

In wounds of the flesh and bones she discharges foreign matter by exciting an inflammation, and supplies the waste of both with new flesh and bone.

II. There are cases where the efforts of nature are too feeble to do service, as in malignant and chronic fevers.

III. There are cases where the efforts of nature are over proportioned to the strength of the disease, as in the cholera morbus and dysentery.

IV. There are cases where nature is idle, as in the atonic stages of the gout, the cancer, the epilepsy, the mania, the venereal disease, the apoplexy, and the tetanus*.

V. There are cases in which nature does mischief. She wastes herself with an unnecessary fever, in a dropsy and consumption. She throws a plethora upon the brain and lungs in the apoplexy and peripneumonĭa notha. She ends a pleurisy and peripneumony in a vomica, or empyema. She creates an unnatural appetite for food in the hypochondriac disease. And, lastly,

* Hoffman de hypothesium medicarum damno, sect. xv.

she drives the melancholy patient to solitude, where, by brooding over the subject of his insanity, he increases his disease.

We are accustomed to hear of the salutary kindness of nature in alarming us with pain, to prompt us to seek for a remedy. But,

VI. There are cases in which she refuses to send this harbinger of the evils which threaten her, as in the aneurism, scirrhus, and stone in the bladder.

VII. There are cases where the pain is not proportioned to the danger, as in the tetanus, consumption, and dropsy of the head. And,

VIII. There are cases where the pain is overproportioned to the danger, as in the paronychia and tooth-ach.

This is a short account of the operations of nature, in the diseases of civilized nations. A lunatic might as well plead against the sequestration of his estate, because he once enjoyed the full exercise of his reason, or because he still had lucid intervals, as nature be exempted from the charges we have brought against her.

But this subject will receive strength from considering the REMEDIES of civilized nations. All the products of the vegetable, fossil, and animal kingdoms, tortured by heat and mixture into an almost infinite variety of forms; bleeding, cupping, artificial drains by setons, issues, and blisters; exercise, active and passive; voyages and journies; baths, warm and cold; waters, saline, aërial, and mineral; food by weight and measure; the royal touch; enchantment; miracles; in a word, the combined discoveries of natural history and philosophy, united into a system of materia medica, all show, that although physicians are in speculation the servants, yet in practice they are the masters of nature. The whole of their remedies seem contrived on purpose to arouse, assist, restrain, and controul her operations.

There are some truths like certain liquors, which require strong heads to bear them. I feel myself protected from the prejudices of vulgar minds, when I reflect that I am delivering these sentiments in a society of philosophers.

Let us now take a COMPARATIVE VIEW of the diseases and remedies of the Indians with those of civilized nations. We shall begin with their diseases.

In our account of the diseases of the Indians, we beheld death executing his commission, it is true; but then his dart was hid in a mantle, under which he concealed his shape. But among civilized nations we behold him multiplying his weapons in proportion to the number of organs and functions in the body; and pointing each of them in such a manner, as to render his messengers more terrible than himself.

We said formerly that fevers constituted the chief diseases of the Indians. According to Doctor Sydenham's computation, above 66,000 out of 100,000 died of fevers in London, about 100 years ago; but fevers now constitute but a little more than one-tenth part of the diseases of that city. Out of 21,780 persons who died in London between December, 1770, and December, 1771, only 2273 died of simple fevers. I have more than once heard Doctor Huck complain, that he could find no marks of epidemic fevers in London, as described by Dr. Sydenham. London has undergone a revolution in its manners and customs since Doctor Sydenham's time. New diseases, the offspring of luxury, have supplanted fevers; and the few that are left are so complicated with other diseases, that their connection can no longer be discovered with an epidemic constitution of the

year. The pleurisy and peripneumony, those inflammatory fevers of strong constitutions, are now lost in catarrhs, or colds, which, instead of challenging the powers of nature or art to a fair combat, insensibly undermine the constitution, and bring on an incurable consumption. Out of 22,434 who died in London between December, 1769, and the same month in 1770, 4594 perished with that British disease. Our countryman, Doctor Maclurg, has ventured to foretel that the gout will be lost in a few years, in a train of hypocondriac, hysteric, and bilious diseases. In like manner, may we not look for a season when fevers, the natural diseases of the human body, will be lost in an inundation of artificial diseases, brought on by the modish practices of civilization?

It may not be improper to compare the PROGNOSIS of the Indians, in diseases, with that of civilized nations, before we take a comparative view of their remedies.

The Indians are said to be successful in predicting the events of diseases. While diseases are simple, the marks which distinguish them, or characterize their several stages, are generally uniform and obvious to the most indifferent observer. These marks afford so much certainty, that the In-

dians sometimes kill their physicians for a false prognosis, charging the death of the patient to their carelessness, or ignorance. They estimate the danger of their patients by the degrees of appetite; while an Indian is able to eat, he is looked upon as free from danger. But when we consider the number and variety in the signs of diseases, among civilized nations, together with the shortness of life, the fallacy of memory, and the uncertainty of observation, where shall we find a physician willing to risk his reputation, much less his life, upon the prediction of the event of our acute diseases? We can derive no advantage from the simple sign, by which the Indians estimate the danger of their patients; for we daily see a want of appetite for food in diseases which are attended with no danger; and we sometimes observe an unusual degree of this appetite to precede the agonies of death. I honour the name of HIPPOCRATES: but forgive me, ye votaries of antiquity, if I attempt to pluck a few grey hairs from his venerable head. I was once an idolater at his altar, nor did I turn apostate from his worship, till I was taught, that not a tenth part of his prognostics corresponded with modern experience, or observation. The pulse*, urine, and sweats, from

* Doctor Cullen used to inform his pupils, that after forty years' experience, he could find no relation between his own

which the principal signs of life and death have been taken, are so variable, in most of the acute diseases of civilized nations, that the wisest physicians have in some measure excluded the prognosis from being a part of their profession.

I am here insensibly led to make an apology for the instability of the theories and practice of physic. The theory of physic is founded upon the laws of the animal economy. These (unlike the laws of the mind, or the common laws of matter) do not appear at once, but are gradually brought to light by the phænomena of diseases. The success of nature in curing the simple diseases of Saxony, laid the foundation for the ANIMA MEDICA of Doctor STAHL. The endemics of Holland* led Doctor BOERHAAVE to seek for the

observations on the pulse, and those made by Doctor Solano. The climate and customs of the people in Spain being so different from the climate and customs of the present inhabitants of Britain, may account for the diversity of their observations. Doctor Heberden's remarks upon the pulse, in the second volume of the Medical Transactions, are calculated to show how little the issue of diseases can be learned from it.

* "The scurvy is very frequent in Holland; and draws its origin partly from their strong food, sea-fish, and smoked

causes of all diseases in the FLUIDS. And the universal prevalence of diseases of the NERVES, in Great-Britain, led Doctor CULLEN to discover their peculiar laws, and to found a system upon them; a system, which will probably last till some new diseases are let loose upon the human species, which shall unfold other laws of the animal economy.

It is in consequence of this fluctuation in the principles and practice of physic, being so necessarily connected with the changes in the customs of civilized nations, that old and young physicians so often disagree in their opinions and practices. And it is by attending to the constant changes in these customs of civilized nations, that those physicians have generally become the most eminent, who have soonest emancipated themselves from the tyranny of the schools of physic; and have occasionally accommodated their principles and

flesh, and partly from their dense and moist air, together with their bad water." Hoffman on Endemical Distempers.

"We are now in North-Holland; and I have never seen, among so few people, so many infected with the leprosy as here. They say the reason is, because they eat so much fish." Howell's Familiar Letters.

practice to the changes in diseases*. This variety in diseases, which is produced by the changes in the customs of civilized nations, will enable us to account for many of the contradictions which are to be found in authors of equal candour and abilities, who have written upon the materia medica.

In forming a comparative view of the REMEDIES of the Indians, with those of civilized nations, we shall remark, that the want of success in a medicine is occasioned by one of the following causes:

First, our ignorance of the disease. Secondly, an ignorance of a suitable remedy. Thirdly, a want of efficacy in the remedy.

* We may learn from these observations, the great impropriety of those Egyptian laws which oblige physicians to adopt, in all cases, the prescriptions which had been collected, and approved of, by the physicians of former ages. Every change in the customs of civilized nations, produces a change in their diseases, which calls for a change in their remedies. What havoc would plentiful bleeding, purging, and small beer, formerly used with so much success by Dr. Sydenham in the cure of fevers, now make upon the enfeebled citizens of London! The fevers of the same, and of more southern latitudes, still admit of such antiphlogistic remedies. In the room of these, bark, wine, and other cordial medicines, are prescribed in London in almost every kind of fever.

Considering the violence of the diseases of the Indians, it is probable their want of success is always occasioned by a want of efficacy in their medicines. But the case is very different among the civilized nations. Dissections daily convince us of our ignorance of the seats of diseases, and cause us to blush at our prescriptions. How often are we disappointed in our expectation from the most certain and powerful of our remedies, by the negligence or obstinacy of our patients! What mischief have we done under the belief of false facts (if I may be allowed the expression) and false theories! We have assisted in multiplying diseases. We have done more—we have increased their mortality.

I shall not pause to beg pardon of the faculty, for acknowledging, in this public manner, the weaknesses of our profession. I am pursuing Truth, and while I can keep my eye fixed upon my guide, I am indifferent whether I am led, provided she is my leader.

But further, the Indian submits to his disease, without one fearful emotion from his doubtfulness of its event; and at last meets his fate without an an anxious wish for futurity; except it is of being admitted to an "equal sky," where

"His faithful dog shall bear him company."

But, among civilized nations, the influence of a false religion in good, and of a true religion in bad men, has converted even the fear of death into a disease. It is this original distemper of the imagination which renders the plague most fatal, upon his first appearance in a country.

Under all these disadvantages in the state of medicine, among civilized nations, do more in proportion die of the diseases peculiar to them, than of fevers, casualties, and old age, among the Indians? If we take our account from the city of London, we shall find this to be the case. Near a twentieth part of its inhabitants perish one year with another. Nor does the natural increase of inhabitants supply this yearly waste. If we judge from the bills of mortality, the city of London contains fewer inhabitants, by several thousands, than it did forty years ago. It appears from this fact, and many others of a like nature, which might be adduced, that although the difficulty of supporting children, together with some peculiar customs of the Indians, which we mentioned, limit their number, yet they multiply faster, and die in a smaller proportion than civilized nations, under the circumstances we have described. The

Indians, we are told, were numerous in this country, before the Europeans settled among them. Travellers agree likewise in describing numbers of both sexes who exhibited all the marks of extreme old age. It is remarkable that age seldom impairs the faculties of their minds.

The mortality peculiar to those Indian tribes who have mingled with the white people, must be ascribed to the extensive mischief of spiritous liquors. When these have not acted, they have suffered from having accommodated themselves too suddenly to the European diet, dress, and manners. It does not become us to pry too much into futurity; but if we may judge from the fate of the original natives of Hispaniola, Jamaica, and the provinces on the continent, we may venture to foretel, that, in proportion as the white people multiply, the Indians will diminish; so that in a few centuries they will probably be entirely extirpated*.

* Even the influence of CHRISTIAN principles has not been able to put a stop to the mortality introduced among the Indians, by their intercourse with the Europeans. Dr. Cotton Mather, in a letter to sir William Ashurst, printed in Boston, in the year 1705, says, "that about five years before there were about thirty Indian congregations in the southern parts of the province of Massachusetts-Bay." The

It may be said, that health among the Indians, like insensibility to cold and hunger, is proportioned to their need of it; and that the less degrees, or entire want of health, are no interruption to the ordinary business of civilized life.

To obviate this supposition, we shall first attend to the effects of a single disease in those people who are the principal wheels in the machine of civil society. Justice has stopt its current, victories have been lost, wars have been prolonged, and embassies delayed, by the principal actors in these departments of government being suddenly laid up by a fit of the gout. How many offences are daily committed against the rules of good breeding, by the tedious histories of our diseases, which compose so great a part of modern conversation! What sums of money have been lavished in foreign coun-

same author, in his history of New-England, says, "That in the islands of Nantucket and Martha's Vineyard, there were 3000 *adult* Indians, 1600 of whom professed the christian religion." At present there is but *one* Indian congregration in the whole Massachusetts province.

It may serve to extend our knowledge of diseases, to remark, that epidemics were often observed to prevail among the Indians in Nantucket, without affecting the white people.

tries in pursuit of health*! Families have been ruined by the unavoidable expences of medicines and watering-places. In a word, the swarms of beggars which infest so many of the European countries, urge their petitions for charity chiefly by arguments derived from real or counterfeit diseases; which render them incapable of supporting themselves†.

But may not civilization, while it abates the violence of natural diseases, increase the lenity of those that are artificial, in the same manner that it lessens the strength of natural vices by multiplying them? To answer this question, it will only be necessary to ask another: Who should exchange the heat, thirst, and uneasiness of a fever, for one fit of the colic or stone?

The history of the number, combination, and fashions of the remedies we have given, may serve

* It is said, there are seldom less than 20,000 British subjects in France and Italy; one half of whom reside or travel in those countries upon the account of their health.

† Templeman computes, that Scotland contains 1,500,000 inhabitants; 100,000 of whom, according to Mr. Fletcher, are supported at the public expence. The proportion of poor people is much greater in England, Ireland, France, and Italy.

to humble the pride of philosophy; and to convince us, that with all the advantages of the whole circle of sciences, we are still ignorant of antidotes to many of the diseases of civilized nations. We sometimes sooth our ignorance, by reproaching our idleness in not investigating the remedies peculiar to this country. We are taught to believe that every herb that grows in our woods is possessed of some medicinal virtue, and that Heaven would be wanting in benignity, if our country did not produce remedies for all the different diseases of its inhabitants. It would be arrogating too much to suppose that man was the only creature in our world for whom vegetables grow. The beasts, birds, and insects, derive their sustenance either directly or indirectly from them; while many of them were probably intended, from their variety in figure, foliage, and colour, only to serve as ornaments for our globe. It would seem strange that the Author of nature should furnish every spot of ground with medicines adapted to the diseases of its inhabitants, and at the same time deny it the more necessary articles of food and clothing. I know not whether Heaven has provided every country with antidotes even to the *natural* diseases of its inhabitants. The intermitting fever is common in almost every corner of the globe; but a sovereign remedy for it has been discovered only

in South-America. The combination of bitter and astringent substances, which serve as a succedaneum to the Peruvian bark, is as much a preparation of art, as calomel or tartar emetic. Societies stand in need of each other as much as individuals; and the goodness of the Deity remains unimpeached when we suppose, that he intended medicines to serve (with other articles) to promote that knowledge, humanity, and politeness among the inhabitants of the earth, which have been so justly attributed to commerce.

We have no discoveries in the materia medica to hope for from the Indians in North-America. It would be a reproach to our schools of physic, if modern physicians were not more successful than the Indians, even in the treatment of their own diseases.

Do the blessings of civilization compensate for the sacrifice we make of natural health, as well as of natural liberty? This question must be answered under some limitations. When natural liberty is given up for laws which enslave instead of protecting us, we are immense losers by the exchange. Thus, if we arm the whole elements against our health, and render every pore in the body an ave-

cine for a disease, we pay too high a price for the blessings of civilization.

In governments which have departed entirely from their simplicity, partial evils are to be cured by nothing but an entire renovation of their constitution. Let the world bear with the professions of law, physic, and divinity; and let the lawyer, physician, and divine yet learn to bear with each other. They are all necessary, in the present state of society. In like manner, let the woman of fashion forget the delicacy of her sex, and submit to be delivered by a man-midwife*. Let her snatch her offspring from her breast, and send it to repair the weakness of its stamina, with the milk of a ruddy cottager†. Let art supply the place of nature

* In the enervated age of Athens, a law was passed which confined the practice of midwifery only to the men. It was, however, repealed, upon a woman's dying in childbirth, rather than be delivered by a man-midwife. It appears from the bills of mortality in London and Dublin, that about one in seventy of those women die in childbirth, who are in the hands of midwives; but from the accounts of the lying-in hospitals in those cities, which are under the care of man-midwives, only one in a hundred and forty perishes in childbirth.

† There has been much common-place declamation against the custom among the great, of not suckling their

in the preparation and digestion of all our aliment. Let our fine ladies keep up their colour with carmine, and their spirits with ratifia; and let our fine gentlemen defend themselves from the excesses of heat and cold, with lavender and hartshorn. These customs have become necessary in the corrupt stages of society. We must imitate, in these cases, the practice of those physicians who consult the appetite only, in diseases which do not admit of a remedy.

The state of a country in point of population, temperance, and industry, is so connected with its diseases, that a tolerable idea may be formed of it,

children. Nurses were common in Rome, in the declension of the empire: hence we find Cornelia commended as a rare example of maternal virtue, as much for suckling her sons, as for teaching them eloquence. That nurses were common in Egypt, is probable from the contract which Pharaoh's daughter made with the unknown mother of Moses, to allow her wages for suckling her own child. The same degrees of civilization require the same customs. A woman whose times for eating and sleeping are constantly interrupted by the calls of enervating pleasures, must always afford milk of an unwholesome nature. It may truly be said of a child doomed to live on this aliment, that, as soon as it receives its

——— " breath,
It sucks in " the lurking principles of death."

by looking over its bills of mortality. HOSPITALS, with all their boasted advantages, exhibit at the same time monuments of the charity and depravity of a people*. The opulence of physicians, and

* "Aurengezebe, emperor of Persia, being asked, Why he did not build hospitals? said, *I will make my empire so rich, that there shall be no need of hospitals.* He ought to have said, I will begin by rendering my subjects rich, and then I will build hospitals.

"At Rome, the hospitals place every one at his ease, except those who labour, those who are industrious, those who have lands, and those who are engaged in trade.

"I have observed, that wealthy nations have need of hospitals, because fortune subjects them to a thousand accidents; but it is plain, that transient assistances are better than perpetual foundations. The evil is momentary; it is necessary, therefore, that the succour should be of the same nature, and that it be applied to particular accidents." Spirit of Laws, b. xxiii. ch. 29.

It was reserved for the present generation to substitute in the room of public hospitals private DISPENSARIES for the relief of the sick. Philosophy and christianity alike concur in deriving praise and benefit from these excellent institutions. They exhibit something like an application of the mechanical powers to the purposes of benevolence; for in what other charitable institutions do we perceive so great a *quantity* of distress relieved by so small an expence?

the divisions of their offices, into those of surgery, pharmacy, and midwifery, are likewise proofs of the declining state of a country. In the infancy of the Roman empire, the priest performed the office of a physician; so simple were the principles and practice of physic. It was only in the declension of the empire that physicians vied with the emperors of Rome in magnificence and splendour*.

* The first regular practitioners of physic in Rome, were women and slaves. The profession was confined to them above six hundred years. The Romans, during this period, lived chiefly upon vegetables, particularly upon PULSE; and hence they were called, by their neighbours, PULTIFAGI. They were likewise early inured to the healthy employments of war and husbandry. Their diseases, of course, were too few and simple to render the cure of them an object of liberal profession. When their diseases became more numerous and complicated, their investigation and cure required the aids of philosophy. The profession from this time became liberal; and maintained a rank with the other professions which are founded upon the imperfection and depravity of human institutions. Physicians are as necessary in the advanced stages of society as surgeons, although their office is less ancient and certain. There are many artificial diseases, in which they give certain relief; and even where their art fails, their prescriptions are still necessary, in order to smooth the avenues of death.

I am sorry to add, in this place, that the number of patients in the HOSPITAL, and incurables in the ALMSHOUSE of this city, show that we are treading in the enervated steps of our fellow subjects in Britain. Our bills of mortality likewise show the encroachments of British diseases upon us. The NERVOUS FEVER has become so familiar to us, that we look upon it as a natural disease. Dr. Sydenham, so faithful in his history of fevers, takes no notice of it. Dr. Cadwallader informed me, that it made its first appearance in this city about five and twenty years ago. It will be impossible to name the CONSUMPTION without recalling to our minds the memory of some friend or relation, who has perished within these few years by that disease. Its rapid progress among us has been unjustly attributed to the growing resemblance of our climate to that of Great-Britain. The HYSTERIC and HYPOCHONDRIAC DISEASES, once peculiar to the chambers of the great, are now to be found in our kitchens and workshops. All these diseases have been produced by our having deserted the simple diet and manners of our ancestors.

The blessings of literature, commerce, and religion were not *originally* purchased at the expence of health. The complete enjoyment of health is

as compatible with civilization, as the enjoyment of civil liberty. We read of countries, rich in every thing that can form national happiness and national grandeur, the diseases of which are nearly as few and simple as those of the Indians. We hear of no diseases among the Jews, while they were under their democratical form of government, except such as were inflicted by a supernatural power*. We should be tempted to doubt

* The principal employments of the Jews, like those of the Romans in their simple ages, consisted in war and husbandry. Their diet was plain, consisting chiefly of vegetables. Their only remedies were plasters and ointments; which were calculated for those diseases which are produced by accidents. In proportion as they receded from their simple customs, we find artificial diseases prevail among them. The leprosy made its appearance in their journey through the wilderness. King Asa's pains in his feet, were probably brought on by a fit of the gout. Saul and Nebuchadnezzar were afflicted with a melancholy. In the time of our Saviour, we find an account of all those diseases in Judea, which mark the declension of a people; such as, the palsy, epilepsy, mania, blindness, hemorrhagia uterina, &c. It is unnecessary to suppose, that they were let loose at this juncture, on purpose to give our Saviour an opportunity of making them the chief subject of his miracles. They had been produced from natural causes, by the gradual depravity of their manners. It is remarkable, that our Saviour chose those artificial diseases for the subject of his miracles, in preference to natural diseases. The efforts of nature, and

the accounts given of the populousness of that people, did we not see the practice of their simple customs producing nearly the same populousness in Egypt, Rome, and other countries of antiquity. The empire of China, it is said, contains more inhabitants than the whole of Europe. The political institutions of that country have exempted its inhabitants from a large share of the diseases of other civilized nations. The inhabitants of Swisserland, Denmark, Norway*, and Sweden, enjoy the chief advantages of civilization without having surrendered for them the blessings of natural health. But it is unnecessary to appeal to ancient or remote nations to prove, that health is not incompatible with civilization. The inhabitants of many parts of New-England, particularly of the province of Connecticut, are but little affected by artificial diseases. Some of you may remember the time, and

the operation of medicines, are too slow and uncertain in these cases to detract in the least from the validity of the miracle. He cured Peter's mother-in-law, it is true, of a fever; but to show that the cure was miraculous, the sacred historian adds (contrary to what is common after a fever), "that she arose *immediately*, and ministered unto them."

* In the city of Bergen, which consists of 30,000 inhabitants, there is but one physician; who is supported at the expense of the public. Pontoppidan's Nat. Hist. of Norway.

our fathers have told those of us who do not, when the diseases of PENNSYLVANIA were as few and as simple as those of the Indians. The food of the inhabitants was then simple; their only drink was water; their appetites were restrained by labour; religion excluded the influence of sickening passions; private hospitality supplied the want of a public hospital; nature was their only nurse, and temperance their principal physician. But I must not dwell upon this retrospect of primæval manners; and I am too strongly impressed with a hope of a revival of such happy days, to pronounce them the golden age of our province.

Our esteem for the customs of our savage neighbours will be lessened, when we add, that civilization does not preclude the honours of old age. The proportion of old people is much greater among civilized, than among savage nations. It would be easy to decide this assertion in our favour, by appealing to facts in the natural histories of Britain, Norway, Sweden, North-America*, and several of the West-India islands.

* It has been urged against the state of longevity in America, that the Europeans, who settle among us, generally arrive to a greater age than the Americans. This is not occasioned so much by a peculiar firmness in their stamina, as by an increase of vigour which the constitu-

The laws of decency and nature are not necessarily abolished by the customs of civilized nations. In many of these, we read of women among whom nature alone still performs the office of a midwife*, and who feel the obligations of suckling their children to be equally binding with the common obligations of morality.

tion acquires by a change of climate. A Frenchman (cæteris paribus) outlives an Englishman in England. A Hollander prolongs his life by removing to the Cape of Good Hope. A Portuguese gains fifteen or twenty years by removing to Brazil. And there are good reasons to believe, that a North-American would derive the same advantages, in point of health and longevity, by removing to Europe, which a European derives from coming to this country.

From a calculation made by an ingenious foreigner, it appears, that a greater proportion of old people are to be found in Connecticut, than in any colony in North-America. This colony contains 180,000 inhabitants. They have no public hospitals or poor-houses; nor is a beggar to be seen among them. There cannot be more striking proofs than these facts of the simplicity of their manners.

* Parturition, in the simple ages of all countries, is performed by nature. The Israelitish women were delivered even without the help of the Egyptian midwives. We read of but two women who died in child-birth in the whole history of the Jews. Dr. Bancroft says, that child-bearing

Civilization does not render us less fit for the necessary hardships of war. We read of armies of civilized nations, who have endured degrees of cold, hunger, and fatigue, which have not been exceeded by the savages of any country*.

Civilization does not always multiply the avenues of death. It appears from the bills of mortality, of many countries, that fewer in proportion die among civilized, than among savage nations.

is attended with so little pain in Guiana, that the women seem to be exempted from the curse inflicted upon Eve. These easy births are not confined to warm climates. They are equally safe and easy in Norway and Iceland, according to Pontoppidan and Anderson's histories of those countries.

* Civilized nations have, in the end, always conquered savages as much by their ability to bear hardships, as by their superior military skill. Soldiers are not to be chosen indiscriminately. The greatest generals have looked upon sound constitutions to be as essential to soldiers, as bravery or military discipline. Count Saxe refused soldiers born and bred in large cities; and sought for such only as were bred in mountainous countries. The King of Prussia calls young soldiers only to the dangers and honours of the field, in his elegant poem, Sur l'Art de la Guerre, chant 1. Old soldiers generally lose the advantages of their veteranism, by their habits of idleness and debauchery. An able general, and experienced officers, will always supply the defects of age in young soldiers.

Even the charms of beauty are heightened by civilization. We read of stateliness, proportion, fine teeth* and complexions, in both sexes, forming the principal outlines of national characters.

The danger of many diseases is not proportioned to their violence, but to their duration. America has advanced but a few paces in luxury and effeminacy. There is yet strength enough in her vitals to give life to those parts which are decayed. She may tread back her steps. For this purpose,

I. Let our children be educated in a manner more agreeable to nature.

* Bad teeth are observed chiefly in middle latitudes, which are subject to alternate heats and colds. The inhabitants of Norway and Russia are as remarkable for their fine teeth as the inhabitants of Africa. We observe fine teeth to be universal likewise among the inhabitants of France, who live in a *variable* climate. These have been ascribed to their protecting their heads from the action of the night air by means of woollen night-caps, and to the extraordinary attention to the teeth of their children. These precautions secure good teeth; and are absolutely necessary in all variable climates, where people do not adopt all the customs of the savage life.

II. Let the common people (who constitute the wealth and strength of our country) be preserved from the effects of ardent spirits. Had I a double portion of all that eloquence which has been employed in describing the political evils that lately threatened our country, it would be too little to set forth the numerous and complicated *physical* and *moral* evils which these liquors have introduced among us. To encounter this *hydra* requires an arm accustomed, like that of Hercules, to vanquish monsters. Sir William Temple tells us, that formerly in Spain no man could be admitted as an evidence in a court, who had once been convicted of drunkenness. I do not call for so severe a law in this country. Let us first try the force of severe manners. Lycurgus governed more by these, than by his laws. "Boni mores non bonæ leges," according to Tacitus, were the bulwarks of virtue among the ancient Germans.

III. I despair of being able to call the votaries of Bacchus from their bottle, and shall therefore leave them to be roused by the more eloquent twinges of the gout.

IV. Let us be cautious what kind of manufactures we admit among us. The rickets made their first appearance in the manufacturing towns in

England. Dr. Fothergill informed me, that he had often observed, when a pupil, that the greatest part of the chronic patients in the London Hospital were Spittal-field weavers. I would not be understood, from these facts, to discourage those manufactures which employ women and children: these suffer few inconveniences from a sedentary life: nor do I mean to offer the least restraint to those manufactories among men, which admit of free air, and the exercise of all their limbs. Perhaps a pure air, and the abstraction of spiritous liquors, might render sedentary employments less unhealthy in America, even among men, than in the populous towns of Great-Britain.

The population of a country is not to be accomplished by rewards and punishments. And it is happy for America, that the universal prevalence of the protestant religion, the checks lately given to negro slavery, the general unwillingness among us to acknowledge the usurpations of primogeniture, the universal practice of inoculation for the small-pox, and the absence of the plague, render the interposition of government for that purpose unnecessary.

These advantages can only be secured to our country by AGRICULTURE. This is the true basis

of national health, riches, and populousness. Nations, like individuals, never rise higher than when they are ignorant whether they are tending. It is impossible to tell from history what will be the effects of agriculture, industry, temperance, and commerce, urged on by the competition of colonies, united in the same general pursuits, in a country, which for extent, variety of soil, climate, and number of navigable rivers, has never been equalled in any quarter of the globe. America is the theatre where human nature will probably receive her last and principal literary, moral, and political honours.

But I recal myself from the ages of futurity. The province of Pennsylvania has already shown to her sister colonies, the influence of agriculture and commerce upon the number and happiness of a people. It is scarcely a hundred years since our illustrious legislator, with a handful of men, landed upon these shores. Although the perfection of our government, the healthiness of our climate, and the fertility of our soil, seemed to ensure a rapid settlement of the province; yet it would have required a prescience bordering upon divine, to have foretold, that in such a short space of time, the province would contain above 300,000 inhabitants; and that nearly 30,000 of this number

should compose a city, which should be the third, if not the second in commerce in the British empire. The pursuits of literature require leisure and a total recess from clearing forests, planting, building, and all the common toils of settling a new country: but before these arduous works were accomplished, the SCIENCES, ever fond of the company of liberty and industry, chose this spot for the seat of their empire in this new world. Our COLLEGE, so catholic in its foundation, and extensive in its objects, already sees her sons executing offices in the highest departments of society. I have now the honour of speaking in the presence of a most respectable number of philosophers, physicians, astronomers, botanists, patriots, and legislators; many of whom have already seized the prizes of honour, which their ancestors had allotted to a much later posterity. Our first offering had scarcely found its way into the temple of fame, when the oldest societies in Europe turned their eyes upon us, expecting with impatience to see the mighty fabric of science, which, like a well-built arch, can only rest upon the whole of its materials, completely finished from the treasures of this unexplored quarter of the globe.

It reflects equal honour upon our society and the honourable assembly of our province, to ac-

knowledge, that we have always found the latter willing to encourage by their patronage, and reward by their liberality, all our schemes for promoting useful knowledge. What may we not expect from this harmony between the sciences and government! Methinks I see canals cut, rivers once impassable rendered navigable, bridges erected, and roads improved, to facilitate the exportation of grain. I see the banks of our rivers vying in fruitfulness with the banks of the river of Egypt. I behold our farmers nobles; our merchants princes. But I forbear—imagination cannot swell with the subject.

I beg leave to conclude, by deriving an argument from our connection with the legislature, to remind my auditors of the duty they owe to the society. Patriotism and literature are here connected together; and a man cannot neglect the one, without being destitute of the other. Nature and our ancestors have completed their works among us; and have left us nothing to do, but to enlarge and perpetuate our own happiness.

AN ACCOUNT

OF THE

CLIMATE OF PENNSYLVANIA,

AND ITS

INFLUENCE UPON THE HUMAN BODY.

AN ACCOUNT

OF THE

CLIMATE OF PENNSYLVANIA, &c.

IN order to render the observations upon the epidemic diseases which compose the following volumes more useful, it will be necessary to prefix to them a short account of the climate of Pennsylvania, and of its influence upon the human body. This account may perhaps serve further, to lead to future discoveries, and more extensive observations, upon this subject.

The state of Pennsylvania lies between 39° 43′ 25″, and 42° north latitude, including, of course, 2° 16′ 35″, equal to 157 miles from its southern to its northern boundary. The western extremity of the state is in the longitude of 5° 23′ 40″, and the eastern, is that of 27′ from the meridian of Philadelphia, comprehending in a due west course 311

miles, exclusive of the territory lately purchased by Pennsylvania from the United States, of which as yet no accurate surveys have been obtained. The state is bounded on the south by part of the state of Delaware, by the whole state of Maryland, and by Virginia to her western extremity. The last named state, the territory lately ceded to Connecticut, and Lake Erie, (part of which is included in Pennsylvania) form the western and north-western boundaries of the state. Part of New-York, and the territory lately ceded to Pennsylvania, with a part of Lake Erie, compose the northern, and another part of New-York, with a large extent of New-Jersey (separated from Pennsylvania by the river Delaware), compose the eastern boundaries of the state. The lands which form these boundaries (except a part of the states of Delaware, Maryland, and New-Jersey) are in a state of nature. A large tract of the western and north-eastern parts of Pennsylvania are nearly in the same uncultivated situation.

The state of Pennsylvania is intersected and diversified with numerous rivers and mountains. To describe, or even to name them all, would far exceed the limits I have proposed to this account of our climate. It will be sufficient only to remark, that one of these rivers, viz. the Susquehannah,

begins at the northern boundary of the state, twelve miles from the river Delaware, and winding several hundred miles, through a variegated country, enters the state of Maryland on the southern line, fifty-eight miles westward of Philadelphia; that each of these rivers is supplied by numerous streams of various sizes; that tides flow in parts of two of them, viz. in the Delaware and Schuylkill; that the rest rise and fall alternately in wet and dry weather; and that they descend with great rapidity, over prominent beds of rocks in many places, until they empty themselves into the bays of Delaware and Chesapeak on the east, and into the Ohio on the western part of the state.

The mountains form a considerable part of the state of Pennsylvania. Many of them appear to be reserved as perpetual marks of the original empire of nature in this country. The Allegany, which crosses the state about two hundred miles from Philadelphia, in a north, inclining to an eastern course, is the most considerable and extensive of these mountains. It is called by the Indians the back-bone of the continent. Its heighth, in different places, is supposed to be about 1,300 feet from the adjacent plains.

The soil of Pennsylvania is diversified by its vicinity to mountains and rivers. The vallies and bottoms consist of a black mould, which extends from a foot to four feet in depth. But in general a deep clay forms the surface of the earth. Immense beds of limestone lie beneath this clay in many parts of the state. This account of the soil of Pennsylvania is confined wholly to the lands on the east side of the Allegany mountain. The soil on the west side of this mountain, shall be described in another place.

The city of Philadelphia lies in the latitude of 39° 57′, in longitude 75° 8′ from Greenwich, and fifty-five miles west from the Atlantic ocean.

It is situated about four miles due north from the conflux of the rivers Delaware and Schuylkill. The buildings, which consist chiefly of brick, extend nearly three miles north and south along the Delaware, and above half a mile due west towards the Schuylkill, to which river the limits of the city extend, the whole of which includes a distance of two miles from the Delaware. The land near the rivers, between the city and the conflux of the rivers, is in general low, moist, and subject to be overflowed. The greatest part of it is meadow

ground. The land to the northward and westward, in the vicinity of the city, is high, and in general well cultivated. Before the year 1778, the ground between the present improvements of the city, and the river Schuylkill, was covered with woods. These, together with large tracts of wood to the northward of the city, were cut down during the winter the British army had possession of Philadelphia. I shall hereafter mention the influence which the cutting down of these woods, and the subsequent cultivation of the grounds in the neighbourhood of the city, have had upon the health of its inhabitants.

The mean height of the ground on which the city stands, is about forty feet above the river Delaware. One of the longest and most populous streets in the city rises only a few feet above the river. The air at the north is much purer than at the south end of the city; hence the lamps exhibit a fainter flame in its southern than its northern parts.

The tide of the Delaware seldom rises more than six feet. It flows four miles in an hour. The width of the river near the city is about a mile.

The city, with the adjoining districts of Southwark and the Northern Liberties, contains between 70 and 80,000 inhabitants.

From the accounts which have been handed down to us by our ancestors, there is reason to believe that the climate of Pennsylvania has undergone a material change. Thunder and lightning are less frequent, and the cold of our winters and heat of our summers are less uniform, than they were forty or fifty years ago. Nor is this all. The springs are much colder, and the autumns more temperate than formerly, insomuch that cattle are not housed so soon by one month as they were in former years. Within the last eight years, there have been some exceptions to part of these observations. The winter of the year 1779-80, was uniformly and uncommonly cold. The river Delaware was frozen near three months during this winter, and public roads for waggons and sleighs connected the city of Philadelphia in many places with the Jersey shore. The thickness of the ice in the river near the city, was from sixteen to nineteen inches, and the depth of the frost in the ground was from four to five feet, according to the exposure of the ground, and the quality of the soil. This extraordinary depth of the frost in the earth, compared with its depth in more nor-

thern and colder countries, is occasioned by the long delay of snow, which leaves the earth without a covering during the last autumnal and the first winter months. Many plants were destroyed by the intenseness of the cold during this winter. The ears of horned cattle and the feet of hogs exposed to the air, were frost-bitten; squirrels perished in their holes, and partridges were often found dead in the neighbourhood of farm houses. The mercury in January stood for several hours at 5° below 0, in Fahrenheit's thermometer; and during the whole of this month (except on one day), it never rose in the city of Philadelphia so high as to the freezing point.

The cold in the winter of the year 1783-4 was as intense, but not so steady, as it was in the winter that has been described. It differed from it materially in one particular, viz. there was a thaw in the month of January, which opened all our rivers for a few days.

The summer which succeeded the winter of 1779-80, was uniformly warm. The mercury in the thermometer, during this summer, stood on one day (the 15th of August) at 95°, and fluctuated between 93°, and 80° for many weeks. The thermometer, in every reference that has been, or

shall be made to it, stood in the shade in the open air.

I know it has been said by many old people, that the winters in Pennsylvania are less cold, and the summers less warm, than they were forty or fifty years ago. The want of thermometrical observations before, and during those years, renders it difficult to decide this question. Perhaps the difference of clothing and sensation between youth and old age, in winter and summer, may have laid the foundation of this opinion. I suspect the mean temperature of the air in Pennsylvania has not altered, but that the principal change in our climate consists in the heat and cold being less confined than formerly to their natural seasons. I adopt the opinion of Doctor Williamson* respecting the diminution of the cold in the southern, being occasioned by the cultivation of the northern parts of Europe; but no such cultivation has taken place in the countries which lie to the north-west of Pennsylvania, nor do the partial and imperfect improvements which have been made in the north-west parts of the state, appear to be sufficient to lessen the cold, even in the city of Philadelphia. I have been able to collect no facts, which dispose

* American Philosophical Transactions, vol. I.

me to believe that the winters were colder before the year 1740, than they have been since. In the memorable winter of 1739-40, the Delaware was crossed on the ice, in sleighs, on the 5th of March, old style, and did not open till the 13th of the same month. The ground was covered during this winter with a deep snow, and the rays of the sun were constantly obscured by a mist, which hung in the upper regions of the air. In the winter of 1779-80, the river was navigable on the 4th of March; the depth of the snow was moderate, and the gloominess of the cold was sometime suspended for a few days by a cheerful sun. From these facts, it is probable the winter of 1739-40 was colder than the winter of 1779-80.

The winter of 1804-5 exhibited so many peculiarities that it deserves a place in the history of the climate of Pennsylvania. The navigation of the Delaware was obstructed on the 18th of December. The weather partook of every disagreeable and distressing property of every cold climate on the globe. These were intense cold, deep snows, hail, sleet, high winds, and heavy rains. They generally occurred in succession, but sometimes most of them took place in the course of four and twenty hours. A serene and star-light evening, often preceded a tempestuous day. The mercury

stood for many days, in Philadelphia, at 4° and 6° above 0 in Fahrenheit's thermometer. The medium depth of the snow was two feet, but from its fall being accompanied with high winds, its height in many places was three and four feet, particularly in roads, which it rendered so impassable, as to interrupt business and social intercourse, in many parts of the state. From the great depth of the snow, the ground was so much protected from the cold, that the frost extended but six inches below its surface. The newspapers daily furnished distressing accounts of persons perishing with the cold by land and water, and of shipwrecks on every part of the coast of the United States. Poultry were found dead, or with frozen feet, in their coops, in many places.

This intense cold was not confined to Pennsylvania. In Norfolk, in Virginia, the mercury stood at 18° above 0 on the 22d of January. At Lexington, in Kentucky, it stood at 0 on the 21st of the same month. In Lower Canada the snow was seven feet in depth, which is three feet deeper than in common years. And such was the quantity of ice collected in the northern seas, that a ship was destroyed, and several vessels injured, by large masses of it, floating between the 41st and 42d degrees of north latitude.

Great fears were entertained of an inundation in Pennsylvania, from a sudden thaw of the immense quantities of snow and ice that had accumulated during the winter, in every part of the state; but happily they both dissolved away so gradually, as scarcely to injure a bridge or a road. On the 28th of February the Delaware was navigable, and on the 2d of March no ice was to be seen in it.

Having premised these general remarks, I proceed to observe, that there are seldom more than twenty or thirty days in summer or winter, in Pennsylvania, in which the mercury rises above 80° in the former, or falls below 30° in the latter season. Some old people have remarked, that the number of *extremely* cold and warm days in successive summers and winters, bears an exact proportion to each other. This was strictly true in the years 1787 and 1788.

The warmest part of the day in summer is at two, in ordinary, and at three o'clock in the afternoon, in extremely warm weather. From these hours, the heat gradually diminishes till the ensuing morning. The coolest part of the four and twenty hours, is at the break of day. There are seldom more than three or four nights in a summer in which the heat of the air is nearly the same as in

the preceding day. After the warmest days, the evenings are generally agreeable, and often delightful. The higher the mercury rises in the day time, the lower it falls the succeeding night. The mercury at 80° generally falls to 68°, while it descends, when at 60°, but to 56°. This disproportion between the temperature of the day and night, in summer is always greatest in the month of August. The dews at this time are heavy in proportion to the coolness of the evening. They are sometimes so considerable as to wet the clothes; and there are instances in which marsh-meadows, and even creeks, which have been dry during the summer, have been supplied with their usual waters from no other source, than the dews which have fallen in this month, or in the first weeks of September.

There is another circumstance connected with the one just mentioned, which contributes very much to mitigate the heat of summer, and that is, it seldom continues more than two or three days without being succeeded with showers of rain, accompanied sometimes by thunder and lightning, and afterwards by a north-west wind, which produces a coolness in the air that is highly invigorating and agreeable.

The warmest weather is *generally* in the month of July. But intensely warm days are often felt in May, June, August, and September. In the annexed table of the weather for the year 1787, there is an exception to the first of these remarks. It shows that the mean heat of August was greater by a few degrees than that of July.

The transitions from heat to cold are often very sudden, and sometimes to very distant degrees. After a day in which the mercury has stood at 86° and even 90°, it sometimes falls, in the course of a single night, to the 65th, and even to the 60th degree, insomuch that fires have been found necessary the ensuing morning, especially if the change in the temperature of the air has been accompanied by rain and a south-east wind. In a summer month, in the year 1775, the mercury was observed to fall 20° in an hour and a half. There are few summers in which fires are not agreeable during some parts of them. My ingenious friend, Mr. David Rittenhouse, whose talent for accurate observation extends alike to all subjects, informed me, that he had never passed a summer, during his residence in the country, without discovering frost in every month of the year, except July.

The weather is equally variable in Pennsylvania during the greatest part of the winter. The mercury fell from 37° to 4½° below 0 in four and twenty hours, between the fourth and fifth of February, 1788. In this season nature seems to play at cross purposes. Heavy falls of snow are often succeeded in a few days by a general thaw, which frequently in a short time leaves no vestige of the snow. The rivers Delaware, Schuylkill, and Susquehannah have sometimes been frozen (so as to bear horses and carriages of all kinds) and thawed so as to be passable in boats, two or three times in the course of the same winter. The ice is formed for the most part in a gradual manner, and seldom till the water has been previously chilled by a fall of snow. Sometimes its production is more sudden. On the night of the 31st of December, 1764, the Delaware was completely frozen over between ten o'clock at night and eight the next morning, so as to bear the weight of a man. An unusual vapour like a fog was seen to rise from the water, in its passage from a fluid to a solid state.

This account of the variableness of the weather in winter, does not apply to every part of Pennsylvania. There is a line about the 41° of the state, beyond which the winters are steady and

regular, insomuch that the earth there is seldom without a covering of snow during the three winter months. In this line the climate of Pennsylvania forms a union with the climate of the eastern and northern states.

The time in which frost and ice begin to show themselves in the neighbourhood of Philadelphia, is generally about the latter end of October or the beginning of November. But the intense cold seldom sets in till about the the 20th or 25th of December; hence the common saying, "as the day "lengthens, the cold strengthens." The coldest weather is commonly in January. The navigation of the river Delaware, after being frozen, is seldom practicable for large vessels, before the first week in March.

As in summer there are often days in which fires are agreeable, so there are sometimes days in winter in which they are disagreeable. Vegetation has been observed in all the winter months. Garlic was tasted in butter in January, 1781. The leaves of the willow, the blossoms of the peach tree, and the flowers of the dandelion and the crocus, were all seen in February, 1779; and I well recollect, when a school-boy, to have seen an apple orchard in full bloom, and small ap-

ples on many of the trees, in the month of December.

A cold day in winter is often succeeded by a moderate evening. The coldest part of the four and twenty hours, is generally at the break of day.

In the most intense cold which has been recorded in Philadelphia, within the last twenty years, the mercury stood at 5° below 0. But it appears from the accounts published by Messieurs Mason and Dixon, in the 58th volume of the Transactions of the Royal Society of London, that the mercury stood at 22° below 0, on the 2d of January, 1767, at Brandywine, about thirty miles to the westward of Philadelphia. They inform us, that on the 1st of the same month, the mercury stood at 20°, and on the day before at 7° below 0. I have to lament that I am not able to procure any record of the temperature of the air in the same year in Philadelphia. From the variety in the height and quality of the soil, and from the difference in the currents of winds and the quantity of rain and snow which fall in different parts of the state, it is very probable this excessive cold may not have extended thirty miles from the place where it was first perceived.

The greatest degree of heat upon record in Philadelphia, is 95°.

The standard temperature of the air in the city of Philadelphia is 52½°, which is the temperature of our deepest wells, as also the mean heat of our common spring water.

The spring in Pennsylvania is generally less pleasant than in many other countries. In March the weather is stormy, variable, and cold. In April, and sometimes in the beginning of May, it is moist, and accompanied by a degree of cold which has been called *rawness*, and which, from its disagreeable effects upon the temper, has been called the *sirocco* of this country. From the variable nature of the weather in the spring, vegetation advances very differently in different years. The colder the spring, the more favourable it proves to the fruits of the earth. The hopes of the farmer from his fruit-trees in a warm spring are often blasted by a frost in April and May. A fall of snow is remembered with regret by many of them, on the night between the 3d and 4th of May, in the year 1774; also on the morning of the 8th of May, 1803. Such was its quantity on the latter day, that it broke down the limbs of many poplar trees. This effect was ascribed to its not being

accompanied with any wind. The colder the winter, the greater delay we generally observe in the return of the ensuing spring.

Sometimes the weather during the spring months is cloudy and damp, attended occasionally with a gentle fall of rain resembling the spray from a cataract of water. A day of this kind of weather is called, from its resemblance to a damp day in Great-Britain, "an English day." This damp weather seldom continues more than three or four days. The month of May, 1786, will long be remembered, for having furnished a very uncommon instance of the absence of the sun for fourteen days, and of constant damp or rainy weather.

The month of June is the only month in the year which resembles a spring month in the southern countries of Europe. The weather is then generally temperate, the sky is serene, and the verdure of the country is universal and delightful.

The autumn is the most agreeable season in the year in Pennsylvania. The cool evenings and mornings, which generally begin about the first week in September, are succeeded by a moderate temperature of the air during the day. This kind of weather continues with an increase of cold

scarcely perceptible, till the middle of October, when the autumn is closed by rain, which sometimes falls in such quantities as to produce destructive freshes in the rivers and creeks, and sometimes descends in gentle showers, which continue, with occasional interruptions by a few fair days, for two or three weeks. These rains are the harbingers of the winter; and the Indians have long ago taught the inhabitants of Pennsylvania, that the degrees of cold during the winter, are in proportion to the quantity of rain which falls during the autumn*.

From this account of the temperature of the air in Pennsylvania, it is evident that there are seldom

* I cannot help agreeing with Mr. Kirwan, in one of his remarks upon the science of meteorology, in the preface to his estimate of the temperature of different latitudes. "This "science (says he), if brought to perfection, would enable "us at least to foresee those changes in the weather which "we could not prevent. Great as is the distance between "such knowledge and our own present attainments, we have "no reason to think it above the level of the powers of the "human mind. The motions of the planets must have appeared as perplexed and intricate to those who first contemplated them; yet, by persevering industry, they are "now known to the utmost precision. The present is (as "the great Leibnitz expresses it) in every case pregnant

more than four months in which the weather is agreeable without a fire.

In winter the winds generally come from the north-west in *fair*, and from the north-east in *wet* weather. The north-west winds are uncommonly dry as well as cold. It is in consequence of the violent action of these winds that trees have uniformly a thicker and more compact bark on their northern than on their southern exposures. Even brick houses are affected by the force and dryness of these north-west winds: hence it is much more difficult to demolish the northern than the southern walls of an old brick house. This fact was communicated to me by an eminent bricklayer in the city of Philadelphia.

The winds in fair weather in the spring, and in warm weather in the summer, blow from the south-west and from west-north-west. The *raw* air before-mentioned comes from the north-east. The south-west winds likewise usually bring with

" with the future, and the connection must be found by long " and attentive observation."

The influence which the perfection of this science must have upon health, agriculture, navigation, and commerce, is too obvious to be mentioned.

them those showers of rain in the spring and summer which refresh the earth. They moreover moderate the heat of the weather, provided they are succeeded by a north-west wind. Now and then showers of rain come from the west-north-west.

There is a common fact connected with the account of the usual winds in Pennsylvania, which it may not be improper to mention in this place. While the clouds are seen flying from the south-west, the *scud*, as it is called, or a light vapour, is seen at the same time flying below the clouds from the north-east.

The moisture of the air is much greater than formerly, occasioned probably by the exhalations which in former years fell in the form of snow, now descending in the form of rain. The depth of the snow is sometimes between two and three feet, but in general seldom exceeds between six and nine inches.

Hail frequently descends with snow in winter. Once in four or five years large and heavy showers of hail fall in the spring and summer. They generally run in narrow veins (as they are called)

of thirty or forty miles in length, and two or three miles in breadth. The heaviest shower of hail that is remembered in Philadelphia, did not extend in breadth more than half a mile north and south. Some of the stones weighed half an ounce. The windows of many houses were broken by them. This shower fell in May, 1783.

From sudden changes in the air, rain and snow often fall together, forming what is commonly called *sleet*.

In the uncultivated parts of the state, the snow sometimes lies on the ground till the first week in April. The backwardness of the spring has been ascribed to the passage of the air over the undissolved beds of snow and ice which usually remain, after the winter months are past, on the north-west grounds and waters of the state, and of the adjacent country.

The dissolution of the ice and snow in the spring is sometimes so sudden as to swell the creeks and rivers in every part of the state to such a degree, as not only to lay waste the hopes of the husbandman from the produce of his lands, but in some instances to sweep his barns, stables, and even his

dwelling house into their currents*. The wind, during a general thaw, comes from the south-west or south-east.

* The following account of the thaw of the river Susquehannah, in the spring of 1784, was published by the author in the Columbian Magazine, for November, 1786. It may serve to illustrate a fact related formerly in the history of the winters in Pennsylvania, as well as to exhibit an extraordinary instance of the destructive effects of a sudden thaw.

"The winter of 1783-4 was uncommonly cold, insomuch that the mercury in Fahrenheit's thermometer stood several times at 5 degrees below 0. The snows were frequent, and, in many places, from two to three feet deep, during the greatest part of the winter. All the rivers in Pennsylvania were frozen, so as to bear waggons and sleds with immense weights. In the month of January a thaw came on suddenly, which opened our rivers so as to set the ice a-driving, to use the phrase of the country. In the course of one night, during the thaw, the wind shifted suddenly to the north-west, and the weather became intensely cold. The ice, which had floated the day before, was suddenly obstructed; and in the river Susquehannah, the obstructions were formed in those places where the water was most shallow, or where it had been accustomed to fall. This river is several hundred miles in length, and from half a mile to a mile and a half in breadth, and winds through a hilly, and in many places a fertile and highly cultivated country. It has as yet a most difficult communication with our bays and the sea, occasioned by the number and height of the falls which occur near the mouth of the river. The

The air, when dry in Pennsylvania, has a peculiar elasticity, which renders the heat and cold

ice in many places, especially where there were falls, formed a kind of dam, of a most stupendous height. About the middle of March our weather moderated, and a thaw became general. The effects of it were remarkable in all our rivers; but in none so much as in the river I have mentioned. I shall therefore endeavour in a few words to describe them. Unfortunately the dams of ice did not give way all at once, nor those which lay nearest to the mouth of the river, first. While the upper dams were set afloat by the warm weather, the lower ones, which were the largest, and in which, of course, the ice was most impacted, remained fixed. In consequence of this, the river rose in a few hours, in many places, above 30 feet, rolling upon its surface large lumps of ice, from 10 to 40 cubic feet in size. The effects of this sudden inundation were terrible. Whole farms were laid under water. Barns, stables, horses, cattle, fences, mills of every kind, and, in one instance, a large stone house, 40 by 30 feet, were carried down the stream. Large trees were torn up by the roots; several small islands, covered with woods, were swept away, and not a vestige of them was left behind. On the barns which preserved their shape, in some instances, for many miles were to be seen living fowls; and, in one dwelling, a candle was seen to burn for some time, after it was swept from its foundation. Where the shore was level, the lumps of ice, and the ruins of houses and farms, were thrown a quarter of a mile from the ordinary height of the river. In some instances, farms were ruined by the mould being swept from them by the cakes of ice, or by depositions of sand; while others were enriched by large depositions of mud. The damage, upon

less insupportable than the same degrees of both are in moister countries. It is in those cases only when summer showers are not succeeded by north-west winds, that the heat of the air becomes oppressive and distressing, from being combined with moisture.

From tradition, as well as living observation, it is evident, that the waters in many of the creeks in Pennsylvania have diminished considerably within the last fifty years. Hence many mills, erected upon large and deep streams of water, now stand idle in dry weather; and many creeks, once navigable in large boats, are now impassable even in canoes. This diminution of the waters has been

the whole, done to the state of Pennsylvania by this fresh, was very great. In most places it happened in the day time, or the consequences must have been fatal to many thousands."

"I know of but one use that can be derived from recording the history of this inundation. In case of similar obstructions of rivers, from the causes such as have been described, the terrible effects of their being set in motion by means of a general thaw may in part be obviated, by removing such things out of the course of the water and ice as are within our power; particularly cattle, hay, grain, fences, and farming utensils of all kinds."

ascribed to the application of a part of them to the purpose of making meadows.

The mean elevation of the barometer in Philadelphia, is about 30 inches. The variations in the barometer are very inconsiderable in the greatest changes of the weather, which occur in the city of Philadelphia. During the violent and destructive storm which blew from the south-west on the 11th of November, 1788, it suddenly fell from 30 to 29$\frac{4}{10}$. Mr. Rittenhouse informs me, that long and faithful observations have satisfied him, that the alterations in the height of the mercury in the barometer do not *precede* but always *succeed* changes in the weather. It falls with the south and south-west, and rises with the north and north-west winds.

The quantity of water which falls in rain and snow, one year with another, amounts to from 24 to 36 inches. But to complete the account of variable qualities in the climate, it will be necessary to add, that our summers and autumns are sometimes marked by a *deficiency*, and sometimes by an *excessive* quantity of rain. The summer and autumn of 1782 were uncommonly dry. Near two months elapsed without a single shower of rain. There were only two showers in the whole

months of September and October. In consequence of this dry weather, there was no second crop of hay. The Indian corn failed of its increase in many places, and was cut down for food for cattle. Trees newly planted, died. The pasture fields not only lost their verdure, but threw up small clouds of dust when agitated by the feet of men, or beasts. Cattle in some instances were driven many miles to be watered, every morning and evening. It was remarked during this dry weather, that the sheep were uncommonly fat, and their flesh well tasted, while all the other domestic animals languished from the want of grass and water. The earth became so inflammable in some places, as to burn above a foot below its surface. A complete consumption of the turf by an accidental fire kindled in the adjoining state of New-Jersey, spread terror and distress through a large tract of country. Springs of water and large creeks were dried up in many parts of the state. Rocks appeared in the river Schuylkill, which had never been observed before, by the oldest persons then alive. On one of them were cut the figures 1701. The atmosphere, during part of this dry weather, was often filled, especially in the mornings, with a thin mist, which, while it deceived with the expectation of rain, served the valuable purpose of abating the heat of the sun. A similar mist was ob-

served in France by Dr. Franklin, in the summer of 1782. The winter which succeeded it was uncommonly cold in France, as well as in Pennsylvania. I am sorry that I am not able to furnish the mean heat of each of the summer months. My notes of the weather enable me to add nothing further upon this subject, than that the summer was "uncommonly cool."

The summer of the year 1788 afforded a remarkable instance of *excess* in the quantity of rain which sometimes falls in Pennsylvania. Thirteen days are marked with rain in July, in the records of the weather kept at Spring-Mill. There fell on the 18th and 19th of August seven inches of rain in the city of Philadelphia. The wheat suffered greatly by the constant rains of July in the eastern and middle parts of the state. So unproductive a harvest in grain, from wet weather, had not been known, it is said, in the course of the last 70 years. The heat of the air, during these summer months was very moderate. Its mean temperature at Spring-Mill was 67,8 in June, 74,7 in July, and only 70,6 in August.

It is some consolation to a citizen of Pennsylvania, in recording facts which seem to militate against our climate, to reflect that the difference of

the weather, in different parts of the state, at the same season, is happily accommodated to promote an increase of the same objects of agriculture; and hence a deficiency of crops has never been known in any one year throughout the *whole* state.

The aurora borealis and meteors are seen occasionally in Pennsylvania. In the present imperfect state of our knowledge of their influence upon the human body, it will be foreign to the design of this history of our climate to describe them.

Storms and hurricanes are not unknown in Pennsylvania. They occur once in four or five years, but they are most frequent and destructive in the autumn. They are generally accompanied by rain. Trees are torn up by the roots, and the rivers and creeks are sometimes swelled so suddenly as to do considerable damage to the adjoining farms. The wind, during these storms, generally blows from the south-east and south-west. In the storms which occurred in September, 1769, and in the same month of the year 1785, the wind veered round contrary to its usual course, and blew from the north.

After what has been said, the character of the climate of Pennsylvania may be summed up in a

few words. There are no two successive years alike. Even the same successive seasons and months differ from each other every year. Perhaps there is but one steady trait in the character of our climate, and that is, it is uniformly variable.

To furnish the reader with a succinct view of the weather in Pennsylvania, that includes all the articles that have been mentioned, I shall here subjoin a table containing the result of meteorological observations made near the river Schuylkill, for one year, in the neighbourhood of Philadelphia, by an ingenious French gentleman, Mr. Legeaux, who divides his time between rural employments, and useful philosophical pursuits. This table is extracted from the Columbian Magazine, for February, 1788. The height of Spring-Mill above the city of Philadelphia, is supposed to be about 70 feet.

METEOROLOGICAL OBSERVATIONS, made at SPRING-MILL, 13 miles NNW. of Philadelphia. Result of the year 1787.

MONTH.	THERMOMETER. of *Fahrenheit*, mean degree D.	1/16	0	de *Reaumur*, degrés moyens D.	1/10	0	BAROMETER. mean height in.	pts.	1/16	WIND. PREVAILING	DAYS of air. bor.	of rain.	of thunder.	of snow.	of tempest.	WATER of RAIN and SNOW. in.	pts.	1/16	WEATHER.
January	35	1		1	4		29	9	9	Variable still		7	1	4		3	10	10	Fair, still, cold, and snow.
February	33	8			8		29	9	9	NE		3		3	2	3	7	3	Fair, overcast.
March	45	1		5	8		29	9	7	W		6		3		2	4	2	Fair, windy.
April	54	3		9	9		29	9	6	Still, SW		3	2	1	2	1	2	13	Fair, and very dry.
May	61	2		13			29	9	2	Still, WSW	1	14	6		2	4	11	4	Foggy, cold, and wet.
June	70	7		17	2		29	8	2	WNW		9	1			1	10	4	Very fair and growing weather.
July	72	2		17	9		29	9	10	WWSW var.	1	5	2			3	1	11	Fair, and overcast.
August	74	5		18	9		29	10	6	W		11	4		1	5	2	3	Very fair, and cloudy.
September	64	7		14	5		29	10	4	WNW		6	1		1	2	7	8	Fair weather.
October	51	1		8	5		29	11	9	WNW vari.	1	4					7	10	Foggy, fair, and dry weather.
November	45	1		5	8		29	11	1	Still, vari.	1	5				2	6	10	Very fair.
December	34				9		29	7	7	WNW					1	1		9	Very fair, and very dry.
RESULT.	10 Feb. greatest D. of cold. 5			10 Feb. D. du plus. gr. froid. 12		0	8 Mar. greatest elevation. 30		10										
	3 July greatest D. of heat. 96	1		3 July plus G. D. de chaud. 28		5	2 Febr. least elevation. 29			WNW	4	73	17	12	9	32	8	14	TEMPERATURE OF THE YEAR 1787.
	Variation. 91	1		Variation. 40		5	Variation. 1		10										Very fair, dry, abundant in every thing, and healthy.
	Temperature. 53	5		Temperature. 9		6	Mean elevat. 20	9	9										

It is worthy of notice, how near the mean heat of the year, and of the month of April, in two successive years, are to each other in the same place. The mean heat of April, 1787, was 54°3, that of April, 1788, was 52°2. By the table of the mean heat of each month in the year, it appears that the mean heat of 1787 was 53°5 at Spring-Mill.

The following accounts of the climates of Pekin and Madrid, which lie within a few minutes of the same latitude as Philadelphia, may serve to show how much climates are altered by local and relative circumstances. The account of the temperature of the air at Pekin will serve further to show, that with all the advantages of the highest degrees of cultivation which have taken place in China, the winters are colder, and the summers warmer there than in Pennsylvania, principally from a cause which will probably operate upon the winters of Pennsylvania for many centuries to come, viz. the vicinity of an uncultivated north-west country.

"PEKIN, lat. 39° 54′, long. 116° 29′ W.

"By five years observations, its annual mean temperature was found to be 55° 5′.

January -	20°,75	July -	84°,8
February	32	August	83
March -	48	September	63
April -	59	October -	52
May -	72	November	41
June -	83,75	December	27

"The temperature of the Atlantic under this parallel is 62, but the standard of this part of the globe is the North Pacific, which is here 4 or 5 degrees colder than the Atlantic. The Yellow Sea is the nearest to Pekin, being about 200 miles distant from it; but it is itself cooled by the mountainous country of Corea, which interposes between it and the ocean, for a considerable part of its extent. Besides, all the northern parts of China (in which Pekin lies) must be cooled by the vicinity of the mountains of Chinese Tartary, among which the cold is said to be excessive.

"The greatest cold usually experienced during this period was 5°, the greatest heat, 98°: on the 25th of July, 1773, the heat arose to 108° and 110°: a N. E. or N. W. wind produces the greatest cold, a S. or S. W. or S. E. the greatest heat*."

* "6. Mem. Scav. Etrang. p. 528."

"MADRID, lat. 40° 25′, long. 3° 20′ E.

"The usual heat in summer is said to be from 75° to 85°; even at night it seldom falls below 70°; the mean height of the barometer is 27,96. It seems to be about 1900 feet above the level of the sea*."

The above accounts are extracted from Mr. Kirwan's useful and elaborate estimate of the temperature of different latitudes.

The history which has been given of the climate of Pennsylvania, is confined chiefly to the country on the east side of the Allegany mountain. On the west side of this mountain, the climate differs materially from that of the south-eastern parts of the state in the temperature of the air, in the effects of the winds upon the weather, and in the quantity of rain and snow which falls every year. The winter seldom breaks up on the mountains before the 25th of March. A fall of snow was once perceived upon it, which measured an inch and a half, on the 11th day of June. The trees which grow upon it are small, and Indian corn is with difficulty brought to maturity,

* "Mem. Par. 1777, p. 146."

even at the foot of the east side of it. The south-west winds on the west side of the mountain are accompanied by cold and rain. The soil is rich, consisting of near a foot, in many places, of black mould. The roads in this country are muddy in winter, but seldom dusty in summer. The arrangement of strata of the earth on the west side, differs materially from their arrangement on the east side the mountain. "The country (says Mr. "Rittenhouse, in a letter to a friend in Philadel-"phia*), when viewed from the western ridge of "the Allegany, appears to be one vast extended "plain. All the various strata of stone seem to "lie undisturbed in the situation in which they "were first formed, and the layers of stone, sand, "clay, and coal, are nearly *horizontal.*"

The temperature of the air on the west is seldom so hot, or so cold, as on the east side of the mountain. By comparing the state of a thermometer examined by Dr. Bedford at Pittsburg, 284 miles from Philadelphia, it appears that the weather was not so cold by twelve degrees in that town, as it was in Philadelphia, on the 5th of February, 1788.

* Columbian Magazine, for October, 1786.

To show the difference between the weather at Spring-Mill and in Pittsburg, I shall here subjoin an account of it, in both places, the first taken by Mr. Legaux, and the other by Doctor Bedford.

METEOROLOGICAL OBSERVATIONS, made at SPRING-MILL, 13 miles NNW. of Philadelphia. April, 1788.

D. of the month.	THERMOMETER of Fahrenheit, mean degree D.	1/10	0	de Reaumur, degrés moyens D.	1/10	0	BAROMETER. mean height in.	pts.	1/10	WIND. PREVAILING	DAYS of aur. boreal.	of rain.	of thunder.	of snow.	of tempest.	WATER. of RAIN and SNOW. in.	pts.	1/10	WEATHER.
1	58	1		11	6		29	10	5	W.									Overcast, fair.
2	46	9		6	9		30	1		Calm.									Overcast and windy.
3	40	3		3	7		30		3	Changeable.		1				1	15		Overcast, rainy.
4	51	3		8	6		29	11	7	SW.									Overcast.
5	51	1		8	5		30		7	E.									Overcast, fair.
6	55	7		10	5		29	11	7	Calm.		1				1	3		Overcast, rainy.
7	51	3		8	6		30	2		NE.		1				2	7		Overcast, rainy.
8	42	1		4	5		29	11		E.		1				1	4		Rainy.
9	63	5		14			29	8		W.									Overcast, windy.
10	46	7		6	5		29	10		W.									Fair.
11	53	8		9	7		30	2		W.									Very fair.
12	44	5		5	5		29	10		Calm.		1				1	11		Overcast, rainy.
13	60	5		12	7		29	10	3	SW.									Very fair.
14	50	2		8	1		29	9		E.		1				1	14		Fair, overcast, rainy.
15	58	1		11	6		29	9	7	SW.		1				2	13		Foggy, rainy.

METEOROLOGICAL OBSERVATIONS, made at PITTSBURG, 284 miles west of Philadelphia. April, 1788.

1	46									SW.		1							Cloudy.
2	42									NE. by N.									Clear.
3	43									SE.		1							Cloudy.
4	64									Calm.									Clear.
5	80									SE. by S.		1	1						Cloudy.
6	52									SW.		1							Cloudy.
7	48									NE. by N.									Cloudy.
8	66									SE. by S.		1	1						Cloudy.
9	56									NW. by N.									Cloudy.
10	60									SW.									Cloudy, with wind.
11	62									Calm.									Clear.
12	67									SW.									Cloudy, with wind.

From a review of all the facts which have been mentioned, it appears that the climate of Pennsylvania is a compound of most of the climates in the world. Here we have the moisture of Britain in the spring, the heat of Africa in summer, the temperature of Italy in June, the sky of Egypt in the autumn, the cold and snows of Norway and the ice of Holland in the winter, the tempests (in a certain degree) of the West-Indies in every season, and the variable winds and weather of Great-Britain in every month of the year.

From this history of the climate of Pennsylvania, it is easy to ascertain what degrees of health, and what diseases prevail in the state. As we have the climates, so we have the health, and the acute diseases, of all the countries that have been mentioned. Without attempting to enumerate the diseases, I shall only add a few words upon the *time* and *manner* in which they are produced.

I. It appears from the testimonies of many aged persons, that pleurisies and inflammatory diseases of all kinds, are less frequent now than they were forty or fifty years ago.

II. It is a well known fact, that intermitting and bilious fevers have increased in Pennsylvania in

proportion as the country has been *cleared of its wood*, in many parts of the state.

III. It is equally certain that these fevers have lessened, or disappeared, in proportion as the country has been *cultivated.*

IV. Heavy rains and freshes in the spring seldom produce fevers, unless they are succeeded by unseasonably warm weather.

V. Sudden changes from great heat to cold, or cool weather, if they occur before the 20th of August, seldom produce fevers. After that time, they are generally followed by them.

VI. The same state of the atmosphere, whether cold or warm, moist or dry, continued for a long time, without any material changes, is always healthy. Acute and inflammatory fevers were in vain looked for in the cold winter of 1779-80. The dry summer of 1782, and the wet summer of 1788, were likewise uncommonly healthy in the city of Philadelphia. These facts extend only to those diseases which depend upon the sensible qualities of the air, for diseases from miasmata and contagion, are less influenced by the uniformity of the weather. The autumn of 1780 was very sickly in

Philadelphia, from the peculiar situation of the grounds in the neighbourhood of the city, while the country was uncommonly healthy. The dry summer and autumn of 1782 were uncommonly sickly in the country, from the extensive sources of morbid exhalations which were left by the diminution of the waters in the creeks and rivers.

VII. Diseases are often *generated* in one season and *produced* in another. Hence we frequently observe fevers of different kinds to *follow* every species of the weather that was mentioned in the last observation.

VIII. The excessive heat in Pennsylvania has sometimes proved fatal to persons who have been much exposed to it. Its morbid effects discover themselves by a difficulty of breathing, a general languor, and, in some instances, by a numbness and an immobility of the extremities. The excessive cold in Pennsylvania has more frequently proved fatal, but it has been chiefly to those persons who have sought a defence from it, by large draughts of spiritous liquors. Its operation in bringing on sleepiness previous to death, is well known. On the 5th of February, 1788, many people were affected by the cold. It produced a violent pain in the head; and, in one instance, a

sickness at the stomach, and a vomiting appeared to be the consequence of it. I have frequently observed that a greater number of old people die, during the continuance of extreme cold and warm weather, than in the same number of days in moderate weather.

IX. May and June are usually the healthiest months in the year.

X. The influence of the winds upon health, depends very much upon the nature of the country over which they pass. Winds which pass over mill-dams and marshes in August and September, generally carry with them the seeds of fevers.

XI. The country in the neighbourhood of Philadelphia was formerly more sickly than the central parts of the city, after the 20th of August. Since the year 1793, the reverse of this has been the case.

XII. The night-air is always unwholesome from the 20th of August, especially during the passive state of the system in *sleep*. The frequent and sudden changes of the air from heat to cold render it unsafe to sleep with open windows, during the autumnal months.

XIII. Valetudinarians always enjoy the most health in Pennsylvania in the summer and winter months. The spring, in a particular manner, is very unfavourable to them.

I shall conclude the account of the influence of the climate of Pennsylvania upon the human body, with the following observations.

1. The sensations of heat and cold are influenced so much by outward circumstances, that we often mistake the degrees of them by neglecting to use such conveniences as are calculated to obviate the effects of their excess. A native of Jamaica often complains less of the heat, and a native of Canada of the cold, in their respective countries, than they do under certain circumstances in Pennsylvania. Even a Pennsylvanian frequently complains less of the heat in Jamaica, and of the cold in Canada, than in his native state. The reason of this is plain. In countries where heat and cold are intense and regular, the inhabitants guard themselves, by accommodating their houses and dresses to each of them. The instability and short duration of excessive heat and cold in Pennsylvania, have unfortunately led its inhabitants, in many instances, to neglect adopting customs, which are used in hot and cold countries to guard against

them. Where houses are built with a southern or south-western front exposure, and where other accommodations to the climate are observed in their construction, the disagreeable excesses of heat and cold are rendered much less perceptible in Pennsylvania. Perhaps the application of the principles of philosophy and taste to the construction of our houses, within the last thirty or forty years, may be another reason why some old people have supposed that the degrees of heat and cold are less in Pennsylvania than they were in former years.

2. The variable nature of the climate of Pennsylvania does not render it *necessarily* unhealthy. Doctor Huxham has taught us, that the healthiest seasons in Great-Britain have often been accompanied by the most variable weather. His words upon this subject convey a reason for the fact. "When the constitutions of the year are frequently "changing, so that by the *contrast* a sort of *equi-* "*librium* is kept up, and health with it; and that "especially if persons are careful to guard them- "selves well against these sudden changes*." Perhaps no climate or country is unhealthy, where men acquire from experience, or tradition, the arts

* Observations on the Air and Epidemic Diseases, vol 1. p. 5.

of accommodating themselves to it. The history of all the nations of the world, whether savage, barbarous, or civilized, previously to a mixture of their manners by an intercourse with strangers, seems to favour this opinion. The climate of China appears, in many particulars, to resemble that of Pennsylvania. The Chinese wear loose garments of different lengths, and increase or diminish the number of them, according to the frequent and sudden changes of their weather; hence they have very few acute diseases among them. Those inhabitants of Pennsylvania who have acquired the arts of conforming to the changes and extremes of our weather in dress, diet, and manners, escape most of those acute diseases which are occasioned by the sensible qualities of the air; and faithful inquiries and observations have proved, that they attain to as great ages as the same number of people in any part of the world.

AN ACCOUNT

OF THE

BILIOUS REMITTING FEVER,

AS IT APPEARED

IN PHILADELPHIA,

IN THE SUMMER AND AUTUMN OF THE YEAR 1780.

AN ACCOUNT

OF THE

BILIOUS REMITTING FEVER, &c.

BEFORE I proceed to describe this fever, it will be necessary to give a short account of the weather, and of the diseases which preceded its appearance.

The spring of 1780 was dry and cool. A catarrh appeared among children between one year, and seven years of age. It was accompanied by a defluxion from the eyes and nose, and by a cough and dyspnœa, resembling, in some instances, the cynanche trachealis, and in others a peripneumony. In some cases it was complicated with the symptoms of a bilious remitting, and intermitting fever. The exacerbations of this fever were always attended with dyspnœa and cough. A few patients expectorated blood. Some had swellings behind

their ears, and others were affected with small ulcers in the throat. I met with only one case of this fever in which the pulse indicated bleeding. The rest yielded in a few days to emetics, blisters, and the bark, assisted by the usual more simple remedies in such diseases.

An intermittent prevailed among adults in the month of May.

July and August were uncommonly warm. The mercury stood on the 6th of August at 94¼°, on the 15th of the same month at 95°, and for several days afterwards at 90°. Many labouring people perished during this month by the heat, and by drinking, not only cold water, but cold liquors of several kinds, while they were under the violent impressions of the heat.

The vomiting and purging prevailed universally, during these two warm months, among the children, and with uncommon degrees of mortality. Children from one year to eight and nine years old were likewise very generally affected by blotches and little boils, especially in their faces. An eruption on the skin, called by the common people the prickly heat, was very common at this time among persons of all ages. The winds during these

months blew chiefly from the south, and south-west. Of course they passed over the land which lies between the city, and the conflux of the rivers Delaware and Schuylkill, the peculiar situation of which, at that time, has been already described.

The dock, and the streets of Philadelphia, supplied the winds at this season, likewise, with a portion of their unwholesome exhalations.

The muschetoes were uncommonly numerous during the autumn. A certain sign (says Dr. Lind) of an unwholesome atmosphere.

The remitting fever made its first appearance in July and August, but its symptoms were so mild, and its extent so confined, that it excited no apprehensions of its subsequent more general prevalence throughout the city.

On the 19th of August the air became suddenly very cool. Many hundred people in the city complained, the next day, of different degrees of indisposition, from a sense of lassitude, to a fever of the remitting type. This was the signal of the epidemic. The weather continued cool during the remaining part of the month, and during the

whole month of September. From the exposure of the district of Southwark (which is often distinguished by the name of the *Hill)* to the south-west winds, the fever made its first appearance in that appendage of the city. Scarcely a family, and, in many families, scarcely a member of them, escaped it. From the Hill it gradually travelled along the second street from the Delaware, improperly called Front-street. For a while it was confined to this street only, after it entered the city, and hence it was called by some people the *Front-street fever.* It gradually spread through other parts of the city, but with very different degrees of violence. It prevailed but little in the Northern Liberties. It was scarcely known beyond Fourth-street from the Delaware. Intemperance in eating or drinking, riding in the sun or rain, watching, fatigue, or even a fright, but more frequently cold, all served to excite the seeds of this fever into action, wherever they existed.

All ages and both sexes were affected by this fever. Seven of the practitioners of physic were confined by it nearly at the same time. The city, during the prevalence of the fever, was filled with an unusual number of strangers, many of whom, particularly the Friends (whose yearly meeting was held in the month of September), were affected

by it. No other febrile disease was observed during this time in the city.

This fever generally came on with rigour, but seldom with a regular chilly fit, and often without any sensation of cold. In some persons it was introduced by a slight sore throat, and in others by a hoarseness which was mistaken for a common cold. A giddiness in the head was the forerunner of the disease in some people. This giddiness attacked so suddenly, as to produce, in several instances, a faintness, and even symptoms of apoplexy. It was remarkable, that all those persons who were affected in this violent manner, recovered in two or three days.

I met with one instance of this fever attacking with coma, and another with convulsions, and with many instances, in which it was introduced by a delirium.

The pains which accompanied this fever were exquisitely severe in the head, back, and limbs. The pains in the head were sometimes in the back parts of it, and at other times they occupied only the eyeballs. In some people, the pains were so acute in their backs and hips, that they could not lie in bed. In others, the pains affected the neck

and arms, so as to produce in one instance a difficulty of moving the fingers of the right hand. They all complained more or less of a soreness in the seats of these pains, particularly when they occupied the head and eyeballs. A few complained of their flesh being sore to the touch, in every part of the body. From these circumstances, the disease was sometimes believed to be a rheumatism; but its more general name among all classes of people was, the *break-bone fever*.

I met with one case of pain in the back, and another of an acute ear-ach, both of which returned periodically every night, and without any fever.

A nausea universally, and in some instances a vomiting, accompanied by a disagreeable taste in the mouth, attended this fever. The bowels were, in most cases, regular, except where the disease fell with its whole force upon them, producing a dysentery.

The tongue was generally moist, and tinctured of a yellow colour.

The urine was high coloured, and in its usual quantity in fevers.

The skin was generally moist, especially where the disease terminated on the third or fourth day.

The pulse was quick and full, but never hard, in a single patient that came under my care, till the 28th of September.

It was remarkable, that little, and, in some instances, no thirst attended this fever.

A screatus, or constant hawking and spitting, attended in many cases through the whole disease, and was a favourable symptom.

There were generally remissions in this fever every morning, and sometimes in the evening, The exacerbations were more severe every other day, and two exacerbations were often observed in one day.

A rash often appeared on the third and fourth days, which proved favourable. This rash was accompanied, in some cases, by a burning in the palms of the hands and soles of the feet. Many people at this time, who were not confined to their beds, and some, who had no fever, had an efflorescence on their skins.

In several persons the force of the disease seemed to fall upon the face, producing swellings under the jaw and in the ears, which in some instances terminated in abscesses.

When the fever did not terminate on the third or fourth day, it frequently ran on to the eleventh, fourteenth, and even twentieth days, assuming in its progress, according to its duration, the usual symptoms of the typhus gravior, or mitior, of Doctor Cullen. In some cases, the discharge of a few spoons-full of blood from the nose accompanied a solution of the fever on the third or fourth day; while in others, a profuse hæmorrhage from the nose, mouth, and bowels, on the tenth and eleventh days, preceded a fatal issue of the disease.

Several cases came under my care, in which the fever was succeeded by a jaundice.

The disease terminated in some cases without sweating, or a sediment in the urine; nor did I observe such patients more disposed to relapse than others, provided they took a sufficient quantity of the bark.

About the beginning of October the weather became cool, accompanied by rain and an easterly

wind. This cool and wet weather continued for four days. The mercury in the thermometer fell to 60°, and fires became agreeable. From this time the fever evidently declined, or was accompanied by inflammatory symptoms. On the 16th of October, I met with a case of inflammatory angina; and on the next day I visited a patient who had a complication of the bilious fever with a pleurisy, and whose blood discovered strong marks of the presence of the inflammatory diathesis. His stools were of a green and black colour. On the third day of his disease a rash appeared on his skin, and on the fourth, in consequence of a second bleeding, his fever terminated with the common symptoms of a crisis.

During the latter end of October, and the first weeks in November, the mercury in the thermometer fluctuated between 50° and 60°. Pleurisies and inflammatory diseases of all kinds now made their appearance. They were more numerous and more acute, than in this stage of the autumn, in former years. I met with one case of pleurisy in November, which did not yield to less than four plentiful bleedings.

I shall now add a short account of the METHOD I pursued in the treatment of this fever.

I generally began by giving a gentle vomit of tartar emetic. This medicine, if given while the fever was in its forming state, frequently produced an immediate cure; and if given after its formation, on the *first* day, seldom failed of producing a crisis on the third or fourth day. The vomit always discharged more or less bile. If a nausea, or an ineffectual attempt to vomit continued after the exhibition of the tartar emetic, I gave a second dose of it with the happiest effects.

If the vomit failed of opening the bowels, I gave gentle doses of salts and cream of tartar*, or of the butter-nut pill†, so as to procure two or three plentiful stools. The matter discharged from the bowels was of a highly bilious nature. It was sometimes so acrid as to excoriate the rectum, and so offensive, as to occasion, in some cases,

* I have found that cream of tartar renders the purging neutral salts less disagreeable to the taste and stomach; but accident has lately taught me, that the juice of two limes or of one lemon, with about half an ounce of loaf sugar, added to six drachms of Glauber or Epsom salt, in half a pint of boiling water, form a mixture that is nearly as pleasant as strong beverage.

† This pill is made from an extract of a strong decoction of the inner bark of the white walnut-tree.

sickness and faintness both in the patients and in their attendants. In every instance, the patients found relief by these evacuations, especially from the pains in the head and limbs.

In those cases, where the prejudices of the patients against an emetic, or where an advanced state of pregnancy, or a habitual predisposition to a vomitting of blood occurred, I discharged the bile entirely by means of the lenient purges that have been mentioned. In this practice I had the example of Doctor Cleghorn, who prescribed purges with great success in a fever of the same kind in Minorca, with that which has been described*. Doctor Lining prescribed purges with equal success in an autumnal pleurisy in South Carolina, which I take to have been a form of a bilious remittent, accompanied by an inflammatory affection of the breast.

After evacuating the contents of the stomach and bowels, I gave small doses of tartar emetic, mixed with Glauber's salt. This medicine excited a general perspiration. It likewise kept the bowels gently open, by which means the bile was discharged as fast as it was accumulated.

* The tertiana interposita remissione tantum of Dr. Cullen.

I constantly recommended to my patients, in this stage of the disorder, to *lie in bed.* This favoured the eruption of the rash, and the solution of the disease by perspiration. Persons who struggled against the fever by *sitting up*, or who attempted to shake it off by labour or exercise, either sunk under it, or had a slow recovery.

A clergyman of a respectable character from the country, who was attacked by the disease in the city, returned home, from a desire of being attended by his own family, and died in a few days afterwards. This is only one, of many cases, in which I have observed travelling, even in the easiest carriages, to prove fatal in fevers after they were formed, or after the first symptoms had shown themselves. The quickest and most effectual way of conquering a fever, in most cases, is, by an early submission to it.

The drinks I recommended to my patients were sage and balm teas, weak punch, lemonade, wine whey, tamarind and apple water.

The apple water should be made by pouring boiling water upon slices of raw apples. It is more lively than that which is made by pouring the water on roasted apples.

I found obvious advantages, in many cases, from the use of pediluvia, every night.

In every case, I found the patients refreshed and relieved by frequent changes of their linen.

On the third or fourth day, in the forenoon, the pains in the head and back generally abated, with a sweat which was diffused over the whole body. The pulse at this time remained quick and weak. This was, however, no objection to the use of the bark, a few doses of which immediately abated its quickness, and prevented a return of the fever.

If the fever continued beyond the third or fourth day without an intermission, I always had recourse to blisters. Those which were applied to the neck, and behind the ears, produced the most immediate good effects. They seldom failed of producing an intermission in the fever, the day after they were applied. Where delirium or coma attended, I applied the blister to the neck on the *first* day of the disease. A worthy family in this city will always ascribe the life of a promising boy, of ten years old, to the early application of a blister to the neck, in this fever.

Where the fever did not yield to blisters, and assumed malignant, or typhus symptoms, I gave the medicines usually exhibited in both those states of fever.

I took notice, in the history of this fever, that it was sometimes accompanied with symptoms of a dysentery. Where this disease appeared, I prescribed lenient purges and opiates. Where these failed of success, I gave the bark in the intermissions of the pain in the bowels, and applied blisters to the wrists. The good effects of these remedies led me to conclude, that the dysentery was the febris introversa of Dr. Sydenham.

I am happy in having an opportunity, in this place, of bearing a testimony in favour of the usefulness of OPIUM in this disease, after the necessary evacuations had been made. I yielded, in prescribing it at first, to the earnest solicitations of my patients for something to give them relief from their insupportable pains, particularly when they were seated in the eyeballs and head. Its salutary effects in procuring sweat, and a remission of the fever, led me to prescribe it afterwards in almost every case, and always with the happiest effects. Those physicians enjoy but little pleasure in practising physic, who know not how much

of the pain and anguish of fevers, of a certain kind, may be lessened by the judicious use of opium.

In treating of the remedies used in this disease, I have taken no notice of blood-letting. Out of several hundred patients whom I visited in this fever, I did not meet with a single case, before the 27th of September, in which the state of the pulse indicated this evacuation. It is true, the pulse was *full*, but never *hard*. I acknowledge that I was called to several patients who had been bled without the advice of a physician, who recovered afterwards on the usual days of the solution of the fever. This only can be ascribed to that disposition which Doctor Cleghorn attributes to fevers, to preserve their types under every variety of treatment, as well as constitution. But I am bound to declare further, that I heard of several cases in which bleeding was followed by a fatal termination of the disease.

In this fever relapses were very frequent, from exposure to the rain, sun, or night air, and from an excess in eating or drinking.

The convalescence from this disease was marked by a number of extraordinary symptoms, which

rendered patients the subjects of medical attention for many days after the pulse became perfectly regular, and after the crisis of the disease.

A bitter taste in the mouth, accompanied by a yellow colour on the tongue, continued for near a week.

Most of those who recovered complained of nausea, and a total want of appetite. A faintness, especially upon sitting up in bed, or in a chair, followed this fever. A weakness in the knees was universal. I met with two patients, who were most sensible of this weakness in the right knee. An inflammation in one eye, and in some instances in both eyes, occurred in several patients after their recovery.

But the most remarkable symptom of the convalescence from this fever, was an uncommon dejection of the spirits. I attended two young ladies, who shed tears while they vented their complaints of their sickness and weakness. One of them very aptly proposed to me to change the name of the disease, and to call it, in its present stage, instead of the break-bone, the *break-heart fever*.

To remove these symptoms, I gave the tincture of bark and elixir of vitriol in frequent doses. I likewise recommended the plentiful use of ripe fruits; but I saw the best effects from temperate meals of oysters, and a liberal use of porter. To these was added, gentle exercise in the open air, which gradually completed the cure.

AN ACCOUNT

OF THE

SCARLATINA ANGINOSA,

AS IT

APPEARED IN PHILADELPHIA,

IN THE YEARS 1783 AND 1784.

AN ACCOUNT

OF THE

SCARLATINA ANGINOSA, &c.

THE beginning of the month of July was unusually cool; insomuch that the mercury in Fahrenheit's thermometer stood at 61° in the day time, and fires were very comfortable, especially in the evening. In the last week but one of this month, the weather suddenly became so warm, that the mercury rose to 94½°, at which it remained for three days. As this heat was accompanied by no breeze from any quarter, the sense of it was extremely distressing to many people. Upwards of twenty persons died in the course of those three days, from the excess of the heat, and from drinking cold water. Three old people died suddenly within this space of time. This extreme heat was succeeded by cool weather, the mercury having

fallen to 60°, and the month closed with producing a few intermitting and remitting fevers, together with several cases of inflammatory angina.

The weather in the month of August was extremely variable. The mercury, after standing for several days at 92°, suddenly fell so low, as not only to render fires necessary, but in many places to produce frost.

Every form of fever made its appearance in this month. The synocha was so acute, in several cases, as to require from three to four bleedings. The remitting fever was accompanied by an uncommon degree of nausea and faintness. Several people died, after a few days' illness, of the malignant bilious fever, or typhus gravior, of Dr. Cullen. The intermittents had nothing peculiar in them, in their symptoms or method of cure.

Towards the close of the month, the scarlatina anginosa made its appearance, chiefly among children.

The month of September was cool and dry, and the scarlatina anginosa became epidemic among adults as well as young people. In most of the patients who were affected by it, it came on with

a chilliness and a sickness at the stomach, or a vomiting; which last was so invariably present, that it was with me a pathognomonic sign of the disease. The matter discharged from the stomach was always bile. The swelling of the throat was in some instances so great, as to produce a difficulty of speaking, swallowing, and breathing. In a few instances, the speech was accompanied by a squeaking voice, resembling that which attends the cynanche trachealis. The ulcers on the tonsils were deep, and covered with white, and, in some instances, with black sloughs. In several cases, there was a discharge of a thick mucus from the nose, from the beginning, but it oftener occurred in the decline of the disease, which most frequently happened on the fifth day. Sometimes the subsiding of the swelling of the throat was followed by a swelling behind the ears.

An eruption on the skin generally attended the symptoms which have been described. But this symptom appeared with considerable variety. In some people it preceded, and in others it followed the ulcers and swelling of the throat. In some, it appeared only on the outside of the throat, and on the breast; in others, it appeared chiefly on the limbs. In a few it appeared on the second or third day of the disease, and never returned afterwards.

I saw two cases of eruption without a single symptom of sore throat. The face of one of those patients was swelled, as in the erisypelas. In the other, a young girl of seven years old, there was only a slight redness on the skin. She was seized with a vomiting, and died delirious in fifty-four hours. Soon after her death, a livid colour appeared on the outside of her throat.

The bowels, in this degree of the disease, were in general regular. I can recollect but few cases which were attended by a diarrhœa.

The fever which accompanied the disease was generally the typhus mitior of Doctor Cullen. In a few cases it assumed symptoms of great malignity.

The disease frequently went off with a swelling of the hands and feet. I saw one instance in a gentlewoman, in whom this swelling was absent, who complained of very acute pains in her limbs, resembling those of the rheumatism.

In two cases which terminated fatally, there were large abscesses; the one on the outside, and the other on the inside of the throat. The first of these cases was accompanied by troublesome scitta

on the ends of the fingers. One of these patients lived twenty-eight, and the other above thirty days, and both appeared to die from the discharge which followed the opening of their abscesses.

Between the degrees of the disease which I have described, there were many intermediate degrees of indisposition which belonged to this disease.

I saw in several cases a discharge from behind the ears, and from the nose, with a slight eruption, and no sore throat. All these patients were able to sit up, and walk about.

I saw one instance of a discharge from the inside of one of the ears in a child, who had ulcers in his throat, and the squeaking voice.

In some, a pain in the jaw, with swellings behind the ears, and a slight fever, constituted the whole of the disease.

In one case, the disease came on with a coma, and in several patients it went off with this symptom.

A few instances occurred of adults, who walked about, and even transacted business, until a few hours before they died.

The intermitting fever, which made its appearance in August, was not lost during the month of September. It continued to prevail, but with several peculiar symptoms. In many persons it was accompanied by an eruption on the skin, and a swelling of the hands and feet. In some, it was attended by a sore throat and pains behind the ears. Indeed, such was the predominance of the scarlatina anginosa, that many hundred people complained of sore throats, without any other symptom of indisposition. The slightest occasional or exciting cause, and particularly cold, seldom failed of producing the disease.

The month of October was much cooler than September, and the disease continued, but with less alarming symptoms. In several adults, who were seized with it, the hardness of the pulse indicated blood-letting. The blood, in one case, was covered with a buffy coat, but beneath its surface it was dissolved.

In the month of November, the disease assumed several inflammatory symptoms, and was attended with much less danger than formerly. I visited one patient whose symptoms were so inflammatory as to require two bleedings. During the decline of the disease, many people complained of trouble-

some sores on the ends of their fingers. A number of children likewise had sore throats and fevers, with eruptions on their skins, which resembled the chicken-pox. I am disposed to suspect that this eruption was the effect of a spice of the scarlatina anginosa, as several instances occurred of patients who had all the symptoms of this disease, in whom an eruption of white blisters succeeded their recovery. This form of the disease has been called by Sauvage, the scarlatina variolosa.

I saw one case of sore throat, which was succeeded not only by swellings in the abdomen and limbs, but by a catarrh, which brought on a fatal consumption.

A considerable shock of an earthquake was felt on the 29th of this month, at ten o'clock at night, in the city of Philadelphia; but no change was perceived in the disease, in consequence of it.

In December, January, and February, the weather was intensely cold. There was a thaw for a few days in January, which broke the ice of the Delaware, but it was followed by cold so excessive, as to close the river till the beginning of March. The mercury, on the 28th and 29th of February, stood below 0 in Fahrenheit's thermometer.

For a few weeks in the beginning of December, the disease disappeared in the circle of my patients, but it broke out with great violence the latter end of that month, and in the January following. Some of the worst cases that I met with (three of which proved fatal) were in those two months.

The disease disappeared in the spring, but it spread afterwards through the neighbouring states of New-Jersey, Delaware, and Maryland.

I shall now add an account of the remedies which I administered in this disease.

In every case that I was called to, I began the cure by giving a vomit joined with calomel. The vomit was either tartar emetic or ipecacuanha, according to the prejudices, habits, or constitutions of my patients. A quantity of bile was generally discharged by this medicine. Besides evacuating the contents of the stomach, it cleansed the throat in its passage downwards. To ensure this effect from the calomel, I always directed it to be given mixed with syrup or sugar and water, so as to diffuse it generally over every part of the throat. The calomel seldom failed to produce two or three stools. In several cases I was obliged, by the continuance of nausea, to repeat the emetics,

and always with immediate and obvious advantage. I gave the calomel in moderate doses in every stage of the disease. To restrain its purgative effects, when necessary, I added to it a small quantity of opium.

During the whole course of the disease, where the calomel failed of opening the bowels, I gave lenient purges, when a disposition to costiveness required them.

The throat was kept clean by detergent gargles. In several instances I saw evident advantages from adding a few grains of calomel to them. In cases of great difficulty of swallowing or breathing, the patients found relief from receiving the steams of warm water mixed with a little vinegar, through a funnel into the throat.

A perspiration kept up by gentle doses of antimonials, and diluting drinks, impregnated with wine, always gave relief.

In every case which did not yield to the above remedies on the third day, I applied a blister behind each ear, or one to the neck, and, I think, always with good effects.

I met with no cases in which the bark appeared to be indicated, except the three in which the disease proved fatal. Where the sore throat was blended with the intermitting fever, the bark was given with advantage. But in common cases it was unnecessary. Subsequent observations have led me to believe, with Doctor Withering, that it is sometimes hurtful in this disease.

It proved fatal in many parts of the country, upon its first appearance; but wherever the mode of treatment here delivered was adopted, its mortality was soon checked. The calomel was used very generally in New-Jersey and New-York. In the Delaware state, a physician of character made it a practice not only to give calomel, but to anoint the outside of the throat with mercurial ointment.

ADDITIONAL OBSERVATIONS

UPON THE

Scarlatina Anginosa.

THIS disease has prevailed in Philadelphia, at different seasons, ever since the year 1783. It has blended itself occasionally with all our epidemics. Many cases have come under my notice since its first appearance, in which dropsical swellings have succeeded the fever. In some instances there appeared to be effusions of water not only in the limbs and abdomen, but in the thorax. They yielded, in every case that I attended, to purges of calomel and jalap. Where these swellings were neglected, they sometimes proved fatal.

In the winter of 1786-7, the scarlatina anginosa was blended with the cynanche parotidea, and in one instance with a typhus mitior. The last was

in a young girl of nine years of age. She was seized with a vomiting of bile and an efflorescence on her breast, but discovered no other symptoms of the scarlatina anginosa till the sixteenth day of her fever, when a swelling appeared on the outside of her throat, and after her recovery, a pain and swelling in one of her knees.

In the month of July, 1787, a number of people were affected by sudden swellings of their lips and eyelids. These swellings generally came on in the night, were attended with little or no pain, and went off in two or three days. I met with only one case in which there was a different issue to these symptoms. It was in a patient in the Pennsylvania hospital, in whom a swelling in the lips ended in a suppuration, which, notwithstanding the liberal use of bark and wine, proved fatal in the course of twelve days.

In the months of June and July, 1788, a number of people were affected by sudden swellings, not only of the lips, but of the cheeks and throat. At the same time many persons were affected by an inflammation of the eyes. The swellings were attended with more pain than they were the year before, and some of them required one or two

purges to remove them; but in general they went without medicine, in two or three days.

Is it proper to refer these complaints to the same cause which produces the scarlatina anginosa?

The prevalence of the scarlatina anginosa at the *same time* in this city; its disposition to produce swellings in different parts of the body; and the analogy of the intermitting fever, which often conceals itself under symptoms that are foreign to its usual type; all seem to render this conjecture probable. In one of the cases of an inflammation of the eye, which came under my notice, the patient was affected by a vomiting a few hours before the inflammation appeared, and complained of a sickness at his stomach for two or three days afterwards. Now a vomiting and nausea appear to be very generally symptoms of the scarlatina anginosa.

In the autumn of 1788, the scarlatina anginosa appeared with different degrees of violence in many parts of the city. In two instances it appeared with an obstinate diarrhœa; but it was in young subjects, and not in adults, as described by Doctor Withering. In both cases, the disease

proved fatal; the one on the third, the other on the fifth day.

In the month of December of the same year, I saw one case in which a running from one of the ears, and a deafness came on, on the fifth day, immediately after the discharge of mucus from the nose had ceased. This case terminated favourably on the ninth day, but was succeeded, for several days afterwards, by a troublesome cough.

I shall conclude this essay by the following remarks:

1. Camphor has often been suspended in a bag from the neck, as a preservative against this disease. Repeated observations have taught me, that it possesses little or no efficacy for this purpose. I have had reason to entertain a more favourable opinion of the benefit of washing the hands and face with vinegar, and of rinsing the mouth and throat with vinegar and water every morning, as means of preventing this disease.

2. Whenever I have been called to a patient where the scarlatina appeared to be in a *forming* state, a vomit of ipecacuanha or tartar emetic,

mixed with a few grains of calomel, has never failed of completely checking the disease, or of so far mitigating its violence, as to dispose it to a favourable issue in a few days; and if these observations should serve no other purpose than to awaken the early attention of patients and physicians to this speedy and effectual remedy, they will not have been recorded in vain.

3. When the matter which produces this disease has been received into the body, a purge has prevented its being excited into action, or rendered it mild, throughout a whole family. For this practice I am indebted to some observations on the scarlatina, published by Dr. Sims in the first volume of the Medical Memoirs.

4. During the prevalence of the inflammatory constitution of the atmosphere, between the years 1793 and 1800, this disease occurred occasionally in Philadelphia, and yielded, like the other epidemics of those years, to copious blood-letting, and other depleting remedies.

AN INQUIRY

INTO

THE CAUSE AND CURE

OF

THE CHOLERA INFANTUM.

AN INQUIRY

INTO

THE CAUSE AND CURE

OF

THE CHOLERA INFANTUM.

BY this name I mean to designate a disease, called, in Philadelphia, the "vomiting and purging of children." From the regularity of its appearance in the summer months, it is likewise known by the name of "the disease of the season." It prevails in most of the large towns of the United States. It is distinguished in Charleston, in South Carolina, by the name of "the April and May disease," from making its first appearance in those two months. It seldom appears in Philadelphia till the middle of June, or the beginning of July, and generally continues till near the middle

of September. Its frequency and danger are always in proportion to the heat of the weather. It affects children from the first or second week after their birth, till they are two years old. It sometimes begins with a diarrhœa, which continues for several days without any other symptom of indisposition; but it more frequently comes on with a violent vomiting and purging, and a high fever. The matter discharged from the stomach and bowels is generally yellow or green, but the stools are sometimes slimy and bloody, without any tincture of bile. In some instances they are nearly as limpid as water. Worms are frequently discharged in each kind of the stools that has been described. The children, in this stage of the disease, appear to suffer a good deal of pain. They draw up their feet, and are never easy in one posture. The pulse is quick and weak. The head is unusually warm, while the extremities retain their natural heat, or incline to be cold. The fever is of the remitting kind, and discovers evident exacerbations, especially in the evenings. The disease affects the head so much, as in some instances to produce symptoms not only of delirium, but of mania, insomuch that the children throw their heads backwards and forwards, and sometimes make attempts to scratch, and to bite their parents, nurses, and even themselves. A swelling fre-

quently occurs in the abdomen, and in the face and limbs. An intense thirst attends every stage of the disease. The eyes appear languid and hollow, and the children generally sleep with them half closed. Such is the insensibility of the system in some instances in this disease, that flies have been seen to alight upon the eyes when open, without exciting a motion in the eyelids to remove them. Sometimes the vomiting continues without the purging, but more generally the purging continues without the vomiting, through the whole course of the disease. The stools are frequently large, and extremely fœtid, but in some instances they are without smell, and resemble drinks and aliment which have been taken into the body. The disease is sometimes fatal in a few days. I once saw it carry off a child in four and twenty hours. Its duration is varied by the season of the year, and by the changes in the temperature of the weather. A cool day frequently abates its violence, and disposes it to a favourable termination. It often continues, with occasional variations in its appearance, for six weeks or two months. Where the disease has been of long continuance, the approach of death is gradual, and attended by a number of distressing symptoms. An emaciation of the body to such a degree, as that the bones come through the skin, livid spots, a singultus, convulsions, a

strongly marked hippocratic countenance, and a sore mouth, generally precede the fatal termination of this disease. Few children ever recover, after the last symptoms which have been mentioned make their appearance.

This disease has been ascribed to several causes; of each of which I shall take notice in order.

I. It has been attributed to dentition. To refute this opinion, it will be necessary to observe, that it appears only in one season of the year. Dentition, I acknowledge, sometimes aggravates it; hence we find it is most severe in that period of life, when the greatest number of teeth make their appearance, which is generally about the 10th month. I think I have observed more children to die of this disease at that age, than at any other.

II. Worms have likewise been suspected of being the cause of this disease. To this opinion, I object the uncertainty of worms ever producing an idiopathic fever, and the improbability of their combining in such a manner as to produce an annual epidemic disease of any kind. But further, we often see the disease in all its force, before that age, in which worms usually produce diseases; we likewise often see it resist the most

powerful anthelmintic medicines; and, lastly, it appears from dissection, where the disease has proved fatal, that not a single worm has been discovered in the bowels. It is true, worms are in some instances discharged in this disease, but they are frequently discharged in greater numbers in the hydrocephalus internus, and in the small-pox, and yet who will assert either of those diseases to be produced by worms.

III. The summer fruits have been accused of producing this disease. To this opinion I object, that the disease is but little known in country places, where children eat much more fruit than in cities. As far as I have observed, I am disposed to believe, that the moderate use of ripe fruits, rather tends to prevent, than to induce the disease.

From the discharge of bile which generally introduces the disease, from the remissions and exacerbations of the fever which accompanies it, and from its occurring nearly in the same season with the cholera and remitting fever in adults, I am disposed to consider it as a modification of the same diseases. Its appearance earlier in the season than the cholera and remitting fever in adults, must be ascribed to the constitutions of children being more predisposed from weakness

to be acted upon, by the remote causes which produce those diseases.

I shall now mention the remedies which are proper and useful in this disease.

I. The first indication of cure is to evacuate the bile from the stomach and bowels. This should be done by gentle doses of ipecacuanha, or tartar emetic. The vomits should be repeated occasionally, if indicated, in every stage of the disease. The bowels should be opened by means of calomel, manna, castor oil, or magnesia. I have generally found rhubarb improper for this purpose, while the stomach was in a very irritable state. In those cases, where there is reason to believe that the offending contents of the primæ viæ have been discharged by nature (which is often the case), the emetics and purges should by no means be given; but, instead of them, recourse must be had to

II. Opiates. A few drops of liquid laudanum, combined in a testaceous julep, with peppermint or cinnamon-water, seldom fail of composing the stomach and bowels. In some instances, this medicine alone subdues the disease in two or three days; but where it does not prove so successful,

it produces a remission of pain, and of other distressing symptoms, in every stage of the disease.

III. Demulcent and diluting drinks have an agreeable effect in this disease. Mint and mallow teas, or a tea made of blackberry roots infused in cold water, together with a decoction of the shavings of hartshorn and gum arabic with cinnamon, should all be given in their turns for this purpose.

IV. Glysters made of flaxseed tea, or of mutton broth, or of starch dissolved in water, with a few drops of liquid laudanum in them, give ease, and produce other useful effects.

V. Plasters of Venice treacle applied to the region of the stomach, and flannels dipped in infusions of bitter and aromatic herbs in warm spirits, or Madeira wine, and applied to the region of the abdomen, often afford considerable relief.

VI. As soon as the more violent symptoms of the disease are composed, tonic and cordial medicines should be given. The bark in decoction, or in substance (where it can be retained in that form), mixed with a little nutmeg, often produces the most salutary effects. Port wine or claret

mixed with water are likewise proper in this stage of the disease. After the disease has continued for some time, we often see an appetite suddenly awakened for articles of diet of a stimulating nature. I have seen many children recover from being gratified in an inclination to eat salted fish, and the different kinds of salted meat. In some instances they discover an appetite for butter, and the richest gravies of roasted meats, and eat them with obvious relief to all their symptoms. I once saw a child of sixteen months old, perfectly restored, from the lowest stage of this disease, by eating large quantities of rancid English cheese, and drinking two or three glasses of port wine every day. She would in no instance eat bread with the cheese, nor taste the wine, if it was mixed with water.

We sometimes see relief given by the use of the warm bath, in cases of obstinate pain. The bath is more effectual, if warm wine is used, instead of water.

I have had but few opportunities of trying the effects of cold water applied to the body in this disease; but from the benefit which attended its use in the cases in which it was prescribed, I am disposed to believe that it would do great service,

could we overcome the prejudices which subsist in the minds of parents against it.

After all that has been said in favour of the remedies that have been mentioned, I am sorry to add, that I have very often seen them all administered without effect. My principal dependence, therefore, for many years, has been placed upon

VII. Country air. Out of many hundred children whom I have sent into the country, in every stage of this disease, I have lost but three; two of whom were sent, contrary to my advice, into that unhealthy part of the neighbourhood of Philadelphia called the *Neck*, which lies between the city and the conflux of the rivers Delaware and Schuylkill. I have seen one cure performed by this remedy, after convulsions had taken place. To derive the utmost benefit from the country air, children should be carried out on horseback, or in a carriage, every day; and they should be exposed to the open air as much as possible in fair weather, in the day time. Where the convenience of the constant benefit of country air cannot be obtained, I have seen evident advantages from taking children out of the city once or twice a day. It is extremely agreeable to see the little sufferers revive

as soon as they escape from the city air, and inspire the pure air of the country.

I shall conclude this inquiry, by recommending the following methods of preventing this disease, all of which have been found by experience to be useful.

1. The daily use of the cold bath.

2. A faithful and attentive accommodation of the dresses of children, to the state and changes of the air.

3. A moderate quantity of salted meat taken occasionally in those months in which this disease usually prevails. It is perhaps in part from the daily use of salted meat in diet, that the children of country people escape this disease.

4. The use of sound old wine in the summer months. From a tea-spoon-full, to half a wine glass full, according to the age of the child, may be given every day. It is remarkable, that the children of persons in easy circumstances, who sip occasionally with their parents the remains of a glass of wine after dinner, are much less subject to

this disease, than the children of poor people, who are without the benefit of that article of diet.

5. Cleanliness, both with respect to the skin and clothing of children. Perhaps the neglect of this direction may be another reason why the children of the poor, are most subject to this disease.

6. The removal of children into the country before the approach of warm weather. This advice is peculiarly necessary during the whole period of dentition. I have never known but one instance of a child being affected by this disscee, who had been carried into the country in order to avoid it.

I have only to add to the above observations, that since the prevalence of the yellow fever in Philadelphia after the year 1793, the cholera infantum has assumed symptoms of such malignity, as to require bleeding to cure it. In some cases, two and three bleedings were necessary for that purpose.

OBSERVATIONS

ON THE

CYNANCHE TRACHEALIS.

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CYNANCHE TRACHEALIS.

THE vulgar name of this disease in Pennsylvania is HIVES. It is a corruption of the word *heaves*, which took its rise from the manner in which the lungs heave in breathing. The worst degree of the disease is called the BOWEL HIVES, from the great motion of the abdominal muscles in respiration.

It has been called suffocatio stridula by Dr. Home, and cynanche trachealis by Dr. Cullen. Professor Frank calls it trachitis, and Dr. Darwin considers it as a pleurisy of the windpipe. By the two latter names, the authors mean to convey the correct idea, that the disease is the same in its nature with the common diseases of other internal parts of the body.

It is brought on by the same causes which induce fever, particularly by cold. I have seen it accompany, as well as succeed, the small-pox, measles, scarlet-fever, and apthous sore throat. In the late Dr. Foulke it succeeded acute rheumatism. The late Dr. Sayre informed me, he had seen it occur in a case of yellow fever, in the year 1798.

It sometimes comes on suddenly, but it more frequently creeps on in the form of a common cold. Its symptoms are sometimes constant, but they more generally remit, particularly during the day. It attacks children of all ages, from three months to five years old. But it occasionally attacks adults. It generally runs its course in three or four days, but we now and then see it protracted in a chronic and feeble form, for eight and ten days.

Dissections show the following appearances in the trachea. 1. A slight degree of inflammation. 2. A thick matter resembling mucus. 3. A membrane similar to that which succeeds inflammation in the pleura and bowels, formed from the coagulating lymph of the blood. 4. In some cases the trachea exhibits no marks of disease of any kind. These cases are generally violent, and terminate suddenly. The morbid excitement here transcends

inflammation. Similar instances of the absence of the common signs of disease after death, occur in other parts of the body. Where the cynanche trachealis has appeared in the high grade which has been last mentioned, it has been called spasmodic. Where the serous vessels of the trachea have been tinged with red blood, it has been considered as inflammatory. Where a liquid matter has been found in the trachea, it has been called humoral; and where a membrane has been seen adhering to the trachea, it has received from Dr. Michaelis the name of angina polyposa. But all these different issues of the cynanche trachealis are the effects of a difference only in its force, or in its duration: they all depend upon one remote, and one proximate cause.

In the *forming* state of this disease, which may be easily known by a hoarseness, and a slight degree of stertorous cough, a puke of antimonial wine, tartar emetic, ipecacuanha, or oxymel of squills, is for the most part an immediate cure. To be effectual, it should operate four or five times. Happily children are seldom injured by a little excess in the operation of this class of medicines. I have prevented the formation of this disease many hundred times, and frequently in my own family, by means of this remedy.

After the disease is completely formed, and appears with the usual symptoms described by authors, the remedies should be

1. Blood-letting. The late Dr. Bailie of New-York used to bleed until fainting was induced. His practice has been followed by Dr. Dick of Alexandria, and with great success. I have generally preferred small, but frequent, to copious bleedings. I once drew twelve ounces of blood, at four bleedings, in one day, from a son of Mr. John Carrol, then in the fourth year of his age. Dr. Physick bled a child, of but three months old, three times in one day. Life was saved in both these cases. Powerful as the lancet is, in this disease, its violence and danger require that it should be aided by

2. Vomits. These should be given every day, or oftener, during the continuance of the disease. Their good effects are much more obvious and certain in a disease of the trachea, than of the lungs, and hence their greater utility, as I shall say hereafter, in a consumption from a catarrh, than from any other of its causes.

3. Purges. These should consist of calomel and jalap, or rhubarb, and should always follow

the use of emetics, if they fail of opening the bowels.

4. Calomel should likewise be given in large doses. Dr. Physick gave half a drachm of this medicine, in one day, to the infant whose case has been mentioned. I have never known it excite a salivation when given to children whose ages rendered them subjects of it, probably because it has been given in such large quantities as to pass rapidly through the bowels. Its good effects seem to depend upon its exciting a counter-action in the whole intestinal canal, and thereby lessening the disposition of the tracheal blood-vessels to discharge the mucus, or form the membrane, which have been described.

5. Blisters should be applied to the throat, breast, neck, and even to the limbs.

6. Dr. Archer of Maryland commends, in high terms, the use of polygola, or Seneka snake-root, in this disease. I can say nothing in favour of its exclusive use, from my own experience, having never given it, but as an auxiliary to other remedies.

7. I have seen great relief given by the use of the warm bath, especially when it has been followed by a gentle perspiration.

8. Towards the close of the disease, after the symptoms of great morbid action begin to decline, a few drops of liquid laudanum, by quieting the cough which generally succeeds it, often produce the most salutary effects. They should be given in flaxseed, or bran, or onion tea, of which drinks the patient should drink freely in every stage of the disease.

The cynanche trachealis is attended with most danger, when the patient labours under a *constant* and audible stertorous breathing. The danger is less, when a dry stertorous cough attends, with *easy* respiration in its intervals. The danger is is nearly over, when the cough, though stertorous, is *loose*, and accompanied with a *discharge* of mucus from the trachea.

An eruption of little red blotches, which frequently appears and disappears two or three times in the course of this disease, is always a favourable symptom.

I once attended a man from Virginia, of the name of Bampfield, who, after an attack of this disease, was much distressed with the stertorous breathing and cough which belong to it. I suspected both to arise from a membrane formed by

inflammation in his trachea. This membrane I supposed to be in part detached from the trachea, from the rattling noise which attended his breathing. He had used many remedies for it to no purpose. I advised a salivation, which in less than three weeks perfectly cured him.

Since the general adoption of the remedies which have been enumerated, for the cynanche trachealis, instances of its mortality have become very uncommon in the city of Philadelphia.

AN ACCOUNT

OF THE EFFICACY OF

BLISTERS AND BLEEDING,

IN THE CURE OF OBSTINATE

Intermitting Fevers.

AN ACCOUNT, &c.

THE efficacy of these remedies will probably be disputed by every regular-bred physician, who has not been a witness of their utility in the above disease; but it becomes such physicians, before they decide upon this subject, to remember, that many things are true in medicine, as well as in other branches of philosophy, which are very improbable.

In all those cases of *autumnal* intermittents, whether quotidian, tertian, or quartan, in which the bark did not succeed after three or four days trial, I have seldom found it fail after the application of blisters to the wrists.

But in those cases where blisters had been neglected, or applied without effect, and where the

disease had been protracted into the *winter* months, I have generally cured it by means of one or two moderate bleedings.

The pulse in those cases is generally full, and sometimes a little hard, and the blood when drawn for the most part appears sizy.

The bark is seldom necessary to prevent the return of the disease. It is always ineffectual, where blood-letting is indicated. I have known several instances where pounds of that medicine have been taken without effect, in which the loss of ten or twelve ounces of blood has immediately cured the disease.

I once intended to have added to this account of the efficacy of blisters and bleeding in curing obstinate intermittents, testimonies from a number of medical gentlemen, of the success with which they have used them; but these vouchers have become so numerous, that they would swell this essay far beyond the limits I wish to prescribe to it.

AN ACCOUNT

OF

THE DISEASE OCCASIONED

BY

DRINKING COLD WATER

IN WARM WEATHER,

AND THE METHOD OF CURING IT.

AN ACCOUNT, &c.

FEW summers elapse in Philadelphia, in which there are not instances of many persons being diseased by drinking cold water. In some seasons, four or five persons have died suddenly from this cause, in one day. This mortality falls chiefly upon the labouring part of the community, who seek to allay their thirst by drinking the water from the pumps in the streets, and who are too impatient, or too ignorant, to use the necessary precautions for preventing its morbid or deadly effects upon them. These accidents seldom happen, except when the mercury rises above 85° in Fahrenheit's thermometer.

Three circumstances generally concur to produce disease or death, from drinking cold water. 1. The patient is extremely warm. 2. The water

is extremely cold. And 3. A large quantity of it is suddenly taken into the body. The danger from drinking the cold water is always in proportion to the degrees of combination which occur in the three circumstances that have been mentioned.

The following symptoms generally follow, where cold water has been taken, under the above circumstances, into the body:

In a few minutes after the patient has swallowed the water, he is affected by a dimness of sight; he staggers in attempting to walk, and, unless supported, falls to the ground; he breathes with difficulty; a rattling is heard in his throat; his nostrils and cheeks expand and contract in every act of respiration; his face appears suffused with blood, and of a livid colour; his extremities become cold, and his pulse imperceptible; and, unless relief be speedily obtained, the disease terminates in death, in four or five minutes.

This description includes only the less common cases of the effects of drinking a *large* quantity of *cold* water, when the body is *preternaturally* heated. More frequently, patients are seized with acute spasms in the breast and stomach. These spasms are so painful as to produce syncope, and

even asphyxia. They are sometimes of the tonic, but more frequently of the clonic kind. In the intervals of the spasms, the patient appears to be perfectly well. The intervals between each spasm become longer or shorter, according as the disease tends to life or death.

It may not be improper to take notice, that punch, beer, and even toddy, when drunken under the same circumstances as cold water, have all been known to produce the same morbid and fatal effects.

I know of but one certain remedy for this disease, and that is LIQUID LAUDANUM. The doses of it, as in other cases of spasm, should be proportioned to the violence of the disease. From a teaspoonful to near a table-spoonful have been given in some instances, before relief has been obtained. Where the powers of life appear to be suddenly suspended, the same remedies should be used, which have been so successfully employed in recovering persons supposed to be dead from drowning.

Care should be taken in every case of disease, or apparent death, from drinking cold water, to pre-

vent the patient's suffering from being surrounded, or even attended by too many people.

Persons who have been recovered from the immediate danger which attends this disease, are sometimes affected after it, by inflammations and obstructions in the breast or liver. These generally yield to the usual remedies which are administered in those complaints, when they arise from other causes.

If neither the voice of reason, nor the fatal examples of those who have perished from this cause, are sufficient to produce restraint in drinking a *large* quantity of *cold* liquors, when the body is *preternaturally* heated, then let me advise to

1. Grasp the vessel out of which you are about to drink for a minute or longer, with both your hands. This will abstract a portion of heat from the body, and impart it at the same time to the cold liquor, provided the vessel be made of metal, glass, or earth; for heat follows the same laws, in many instances, in passing through bodies, with regard to its relative velocity, which we observe to take place in electricity.

2. If you are not furnished with a cup, and are obliged to drink by bringing your mouth in contact with the stream which issues from a pump, or a spring, always wash your hands and face, previously to your drinking, with a little of the cold water. By receiving the shock of the water first upon those parts of the body, a portion of its heat is conveyed away, and the vital parts are thereby defended from the action of the cold.

By the use of these preventives, inculcated by advertisements pasted upon pumps by the Humane Society, death from drinking cold water has become a rare occurrence for many years past in Philadelphia.

AN ACCOUNT

OF THE

EFFICACY OF COMMON SALT,

IN THE CURE OF

HÆMOPTYSIS.

AN ACCOUNT, &c.

FROM the present established opinions and practice respecting the cause and cure of hæmoptysis, the last medicine that would occur to a regular-bred physician for the cure of it, is COMMON SALT; and yet I have seen and heard of a great number of cases, in which it has been administered with success.

The mode of giving it is to pour down from a tea to a table-spoonful of clean fine salt, as soon as possible after the hæmorrhage begins from the lungs. This quantity generally stops it; but the dose must be repeated daily for three or four days, to prevent a return of the disease. If the bleeding continue, the salt must be continued till it is checked, but in larger doses. I have heard of several instances in which two table spoons-full were taken at one time for several days.

It sometimes excites a sickness at the stomach, and never fails to produce a burning sensation in the throat, in its passage into the stomach, and considerable thirst afterwards.

I have found this remedy to succeed equally well in hæmorrhages, whether they occurred in young or in old people, or with a weak or active pulse.

I had prescribed it for several years before I could satisfy myself with a theory, to account for its extraordinary action upon the human body. My inquiries led me to attend more particularly to the following facts:

1. Those persons who have been early instructed in vocal music, and who use their vocal organs moderately through life, are seldom affected by a hæmorrhage from the lungs.

2. Lawyers, players, public cryers, and city watchmen, all of whom exercise their lungs either by long or loud speaking, are less affected by this disease, than persons of other occupations.

I acknowledge I cannot extend this observation to the public teachers of religion. I have known

several instances of their being affected by hæmoptysis; but never but one in which the disease came on in the pulpit, and that was in a person who had been recently cured of it. The cases which I have seen, have generally been brought on by catarrhs.

To this disease, the practice of some of our American preachers disposes them in a peculiar manner; for it is very common with this class of them, to expose themselves to the cold or evening air, immediately after taking what a celebrated and eloquent preacher used to call a *pulpit sweat.*

3. This hæmorrhage chiefly occurs in debilitated habits, or in persons afflicted by such a predisposition to consumption, as indicates a weak and relaxed state of the lungs.

4. It generally occurs when the lungs are in a passive state; as in sitting, walking, and more frequently in lying. Many of the cases that I have known, have occurred during *sleep*, in the middle of the night.

From these facts, is it not probable that the common salt, by acting primarily and with great force upon the throat, extends its stimulus to the

bleeding vessel, and by giving it a tone, checks the further effusion of blood?

I shall only add to this conjecture the following observations:

1. I have never known the common salt perform a cure, where the hæmorrhage from the lungs has been a symptom of a confirmed consumption. But even in this case it gives a certain temporary relief.

2. The exhibition of common salt in the hæmoptysis, should by no means supersede the use of occasional bleeding when indicated by plethora, nor of that diet which the state of the pulse, or of the stomach, may require.

3. I have given the common salt in one case with success, in a hæmorrhage from the stomach, accompanied by a vomiting; and have heard of several cases in which it has been supposed to have checked a discharge of blood from the nose and uterus, but I can say nothing further in its favour in these last hæmorrhages, from my own experience.

It may perhaps serve to lessen the prejudices of physicians against adopting improvements in medicine, that are not recommended by the authority of colleges or universities, to add, that we are indebted to an old woman, for the discovery of the efficacy of common salt in the cure of hæmoptysis.

THOUGHTS

UPON

THE CAUSE AND CURE

OF THE

PULMONARY CONSUMPTION.

THOUGHTS, &c.

THE ancient Jews used to say, that a man does not fulfil his duties in life, who passes through it, without building a house, planting a tree, and leaving a child behind him. A physician, in like manner, should consider his obligations to his profession and society as undischarged, who has not attempted to lessen the number of incurable diseases. This is my apology for presuming to make the consumption the object of a medical inquiry.

Perhaps I may suggest an idea, or fact, that may awaken the ideas and facts which now lie useless in the memories or common-place books of other physicians; or I may direct their attention to some useful experiments upon this subject.

I shall begin my observations upon the consumption, by remarking,

1. That it is unknown among the Indians in North-America.

2. It is scarcely known by those citizens of the United States, who live in the *first* stage of civilized life, and who have lately obtained the title of the *first settlers*.

The principal occupations of the Indian consist in war, fishing, and hunting. Those of the first settler, are fishing, hunting, and the laborious employments of subduing the earth, cutting down forests, building a house and barn, and distant excursions, in all kinds of weather, to mills and courts, all of which tend to excite and preserve in the system, something like the Indian vigour of constitution.

3. It is less common in country places than in cities, and increases in both, with intemperance and sedentary modes of life.

4. Ship and house carpenters, smiths, and all those artificers whose business requires great exertions of strength in the *open* air, in *all* seasons of the year, are less subject to this disease, than men who work under cover, and at occupations which do not require the constant action of their limbs.

5. Women, who sit more than men, and whose work is connected with less exertion, are most subject to the consumption.

From these facts it would seem, that the most probable method of curing the consumption, is to revive in the constitution, by means of exercise or labour, that vigour which belongs to the Indians, or to mankind in their first stage of civilization.

The efficacy of these means of curing consumption will appear, when we inquire into the relative merit of the several remedies which have been used by physicians in this disease.

I shall not produce among these remedies the numerous receipts for syrups, boluses, electuaries, decoctions, infusions, pills, medicated waters, powders, draughts, mixtures, and diet-drinks, which have so long and so steadily been used in this disease; nor shall I mention as a remedy, the best accommodated diet, submitted to with the most patient self-denial; for not one of them all, without the aid of exercise, has ever, I believe, cured a single consumption.

1. SEA-VOYAGES have cured consumptions; but it has been only when they have been so long, or so frequent, as to substitute the long continuance of gentle, to violent degrees of exercise of a shorter duration, or where they have been accompanied by some degree of the labour and care of navigating the ship.

2. A CHANGE of CLIMATE has often been prescribed for the cure of consumptions, but I do not recollect an instance of its having succeeded, except when it has been accompanied by exercise, as in travelling, or by some active laborious pursuit.

Doctor Gordon of Madeira, ascribes the inefficacy of the air of Madeira in the consumption, in part to the difficulty patients find of using exercise in carriages, or even on horseback, from the badness of the roads in that island.

3. JOURNIES have often performed cures in the consumption, but it has been chiefly when they have been long, and accompanied by difficulties which have roused and invigorated the powers of the mind and body.

4. VOMITS and NAUSEATING MEDICINES have been much celebrated for the cure of consump-

tions. These, by procuring a temporary determination to the surface of the body, so far lessen the pain and cough, as to enable patients to use profitable exercise. Where this has not accompanied or succeeded the exhibition of vomits, I believe they have seldom afforded any *permanent* relief.

5. BLOOD-LETTING has often relieved consumptions; but it has been only by removing the troublesome symptoms of inflammatory diathesis, and thereby enabling the patients to use exercise, or labour, with advantage.

6. VEGETABLE BITTERS and some of the STIMULATING GUMS have in some instances afforded relief in consumptions; but they have done so only in those cases where there was great debility, accompanied by a total absence of inflammatory diathesis. They have most probably acted by their tonic qualities, as substitutes for labour and exercise.

7. A PLENTIFUL and REGULAR PERSPIRATION, excited by means of a flannel shirt, worn next to the skin, or by means of a stove-room, or by a warm climate, has in many instances *prolonged* life in consumptive habits; but all these remedies have acted as palliatives only, and thereby have

enabled the consumptive patients to enjoy the more beneficial effects of exercise.

8. BLISTERS, SETONS, and ISSUES, by determining the perspirable matter from the lungs to the surface of the body, lessen pain and cough, and thereby prepare the system for the more salutary effects of exercise.

9. The effects of SWINGING upon the pulse and respiration, leave us no room to doubt of its being a tonic remedy, and therefore a safe and agreeable substitute for exercise.

From all these facts it is evident, that the remedies for consumptions must be sought for in those *exercises and employments which give the greatest vigour to the constitution.* And here I am happy in being able to produce several facts which demonstrate the safety and certainty of this method of cure.

During the late war, I saw three instances of persons in confirmed consumptions, who were perfectly cured by the hardships of a military life. They had been my patients previously to their entering into the army. Besides these, I have heard of four well-attested cases of similar reco-

veries from nearly the same remedies. One of these was the son of a farmer in New-Jersey, who was sent to sea as the last resource for a consumption. Soon after he left the American shore, he was taken by a British cruiser, and compelled to share in all the duties and hardships of a common sailor. After serving in this capacity for twenty-two months, he made his escape, and landed at Boston, from whence he travelled on foot to his father's house (nearly four hundred miles), where he arrived in perfect health.

Doctor Way of Wilmington informed me, that a certain Abner Cloud, who was reduced so low by a pulmonary consumption as to be beyond all relief from medicine, was so much relieved by sleeping in the open air, and by the usual toils of building a hut, and improving a farm, in the unsettled parts of a new country in Pennsylvania, that he thought him in a fair way of a perfect recovery.

Doctor Latimer of Wilmington had been long afflicted with a cough and an occasional hæmoptysis. He entered into the American army as a surgeon, and served in that capacity till near the end of the war; during which time he was perfectly free from all pulmonary disease. The

spitting of blood returned soon after he settled in private practice. To remedy this complaint, he had recourse to a low diet, but finding it ineffectual, he partook liberally of the usual diet of healthy men, and he now enjoys a perfect exemption from it.

It would be very easy to add many other cases, in which labour, the employments of agriculture, and a life of hardship by sea and land, have prevented, relieved, or cured, not only the consumption, but pulmonary diseases of all kinds.

To the cases that have been mentioned, I shall add only one more, which was communicated to me by the venerable Doctor Franklin, whose conversation at all times conveyed instruction, and not less in medicine than upon other subjects. In travelling, many years ago, through New-England, the doctor overtook the post-rider; and after some inquiries into the history of his life, he informed him that he was bred a shoemaker; that his confinement, and other circumstances, had brought on a consumption, for which he was ordered by a physician to ride on horseback. Finding this mode of exercise too expensive, he made interest, upon the death of an old post-rider, to succeed to his appointment, in which he perfectly recovered

his health in two years. After this he returned to his old trade, upon which his consumption returned. He again mounted his horse, and rode post in all seasons and weathers, between New-York and Connecticut river (about 140 miles), in which employment he continued upwards of thirty years, in perfect health.

These facts, I hope, are sufficient to establish the advantages of restoring the original vigour of the constitution, in every attempt to effect a radical cure of consumption.

But how shall these remedies be applied in the time of peace, or in a country where the want of woods, and brooks without bridges, forbid the attainment of the laborious pleasures of the Indian mode of hunting; or where the universal extent of civilization does not admit of our advising the toils of a new settlement, and improvements upon bare creation? Under these circumstances, I conceive substitutes may be obtained for each of them, nearly of equal efficacy, and attainable with much less trouble.

1. Doctor Sydenham pronounced riding on horseback, to be as certain a cure for consumptions as bark is for an intermitting fever. I have no

more doubt of the truth of this assertion, than I have that inflammatory fevers are now less frequent in London than they were in the time of Doctor Sydenham. If riding on horseback in consumptions has ceased to be a remedy in Britain, the fault is in the patient, and not in the remedy. "It "is a sign that the stomach requires milk (says "Doctor Cadogan), when it cannot bear it." In like manner, the inability of the patient to bear this manly and wholesome exercise, serves only to demonstrate the necessity and advantages of it. I suspect the same objections to this exercise which have been made in Britain, will not occur in the United States of America; for the Americans, with respect to the symptoms and degrees of epidemic and chronic diseases, appear to be nearly in the same state that the inhabitants of England were in the seventeenth century. We find, in proportion to the decline of the vigour of the body, that many occasional causes produce fever and inflammation, which would not have done it a hundred years ago.

2. The laborious employments of agriculture, if steadily pursued, and accompanied at the same time by the simple, but wholesome diet of a farm-house, and a hard bed, would probably afford a

good substitute for the toils of a savage or military life.

3. Such occupations or professions as require constant labour or exercise in the open air, in all kinds of weather, may easily be chosen for a young man who, either from hereditary predisposition, or an accidental affection of the lungs, is in danger of falling into a consumption. In this we should imitate the advice given by some wise men, always to prefer those professions for our sons, which are the least favourable to the corrupt inclinations of their hearts. For example, where an undue passion for money, or a crafty disposition, discover themselves in early life, we are directed to oppose them by the less profitable and more disinterested professions of divinity or physic, rather than cherish them by trade, or the practice of the law. Agreeably to this analogy, weakly children should be trained to the laborious, and the robust, to the sedentary occupations. From a neglect of this practice, many hundred apprentices to taylors, shoemakers, conveyancers, watchmakers, silversmiths, and mantua-makers, perish every year by consumptions.

4. There is a case recorded by Dr. Smollet, of the efficacy of the cold bath in a consumption; and

I have heard of its having been used with success, in the case of a negro man, in one of the West-India islands. To render this remedy useful, or even safe, it will be necessary to join it with labour, or to use it in degrees that shall prevent the alternation of the system with vigour and debility; for I take the cure of consumption ultimately to depend upon the simple and constant action of tonic remedies. It is to be lamented that it often requires so much time, or such remedies to remove the inflammatory diathesis, which attends the first stage of consumption, as to reduce the patient too low to make use of those tonic remedies afterwards, which would effect a radical cure.

If it were possible to graduate the tone of the system by means of a scale, I would add, that to cure consumption, the system should be raised to the highest degree of this scale. Nothing short of an equilibrium of tone, or a free and vigorous action of every muscle and viscus in the body, will fully come up to a radical cure of this disease.

In regulating the diet of consumptive patients, I conceive it to be as necessary to feel the pulse, as it is in determining when and in what quantity to draw blood. Where inflammatory diathesis prevails, a vegetable diet is certainly proper; but

where the patient has *escaped*, or *passed* this stage of the disease, I believe a vegetable diet alone to be injurious; and am sure a moderate quantity of animal food may be taken with advantage.

The presence or absence of this inflammatory diathesis, furnishes the indications for administering or refraining from the use of the bark and balsamic medicines. With all the testimonies of their having done mischief, many of which I could produce, I have known several cases in which they have been given with obvious advantage; but it was only when there was a total absence of inflammatory diathesis.

Perhaps the remedies I have recommended, and the opinions I have delivered, may derive some support from attending to the analogy of ulcers on the legs, and in other parts of the body. The first of these occur chiefly in habits debilitated by spiritous liquors, and the last frequently in habits debilitated by the scrophula. In curing these diseases, it is in vain to depend upon internal or external medicines. The whole system must be strengthened, or we do nothing; and this is to be effected only by exercise and a generous diet.

In relating the facts that are contained in this inquiry, I wish I could have avoided reasoning upon them; especially as I am confident of the certainty of the facts, and somewhat doubtful of the truth of my reasonings.

I shall only add, that if the cure of consumptions should at last be effected by remedies in every respect the opposites of those palliatives which are now fashionable and universal, no more will happen than what we have already seen in the tetanus, the small-pox, and the management of fractured limbs.

Should this be the case, we shall not be surprised to hear of physicians, instead of prescribing any one, or all of the medicines formerly enumerated for consumptions, ordering their patients to exchange the amusements, or indolence of a city, for the toils of a country life; of their advising farmers to exchange their plentiful tables, and comfortable fire-sides, for the scanty but solid subsistence, and midnight exposure of the herdsman; or of their recommending, not so much the exercise of a *passive* sea voyage, as the *active* labours and dangers of a common sailor. Nor should it surprise us, after what we have seen, to hear patients relate the pleasant adventures of their excursions

or labours, in quest of their recovery from this disease, any more than it does now to see a strong or well-shaped limb that has been broken; or to hear a man talk of his studies, or pleasures, during the time of his being inoculated and attended for the small-pox.

I will not venture to assert, that there does not exist a medicine which shall supply, at least in some degree, the place of the labour or exercises, whose usefulness in consumptions has been established by the facts that have been mentioned. Many instances of the analogous effects of medicines, and of exercise upon the human body, forbid the supposition. If there does exist in nature such a medicine, I am disposed to believe it will be found in the class of TONICS. If this should be the case, I conceive its strength, or its dose, must far exceed the present state of our knowledge or practice, with respect to the efficacy or dose of tonic medicines.

I except the disease, which arises from recent abscesses in the lungs, from the general observation which has been made, respecting the inefficacy of the remedies that were formerly enumerated for the cure of consumptions without labour

or exercise. These abscesses often occur without being preceded by general debility, or accompanied by a consumptive diathesis, and are frequently cured by nature, or by very simple medicines.

OBSERVATIONS UPON WORMS

IN THE

ALIMENTARY CANAL,

AND UPON

ANTHELMINTIC MEDICINES.

OBSERVATIONS, &c.

WITH great diffidence I venture to lay before the public my opinions upon worms: nor should I have presumed to do it, had I not entertained a hope of thereby exciting further inquiries upon this subject.

When we consider how universally worms are found in all young animals, and how frequently they exist in the human body, without producing disease of any kind, it is natural to conclude, that they serve some useful and necessary purposes in the animal economy. Do they consume the superfluous aliment which all young animals are disposed to take, before they have been taught, by experience or reason, the bad consequences which arise from it? It is no objection to this opinion, that worms are unknown in the human body in

some countries. The laws of nature are diversified, and often suspended under peculiar circumstances in many cases, where the departure from uniformity is still more unaccountable, than in the present instance. Do worms produce diseases from an *excess* in their *number*, and an *error* in their place, in the same manner that blood, bile, and air produce diseases from an *error* in their place, or from *excess* in their *quantities?* Before these questions are decided, I shall mention a few facts which have been the result of my own observations upon this subject.

1. In many instances, I have seen worms discharged in the small-pox and measles, from children who were in perfect health previously to their being attacked by those diseases, and who never before discovered a single symptom of worms. I shall say nothing here of the swarms of worms which are discharged in fevers of all kinds, until I attempt to prove that an idiopathic fever is never produced by worms.

2. Nine out of ten of the cases which I have seen of worms, have been in children of the grossest habits and most vigorous constitutions. This is more especially the case where the worms are dislodged by the small-pox and measles. Doctor

Capelle of Wilmington, in a letter which I received from him, informed me, that in the livers of sixteen, out of eighteen rats which he dissected, he found a number of the tænia worms. The rats were fat, and appeared in other respects to have been in perfect health. The two rats in which he found no worms, he says, "were very lean, and "their livers smaller in proportion than the others."

3. In weakly children, I have often known the most powerful anthelmintics given without bringing away a single worm. If these medicines have afforded any relief, it has been by their tonic quality. From this fact, is it not probable—the conjecture, I am afraid, is too bold, but I will risk it:—is it not probable, I say, that children are sometimes disordered from the want of worms? Perhaps the tonic medicines which have been mentioned, render the bowels a more quiet and comfortable asylum for them, and thereby provide the system with the means of obviating the effects of crapulas, to which all children are disposed. It is in this way that nature, in many instances, cures evil by evil. I confine the salutary office of worms only to that species of them which is known by the name of the round worm, and which occurs most frequently in children.

Is there any such disease as an idiopathic WORM-FEVER? The Indians in this country say there is not, and ascribe the discharge of worms to a fever, and not a fever to the worms*.

By adopting this opinion, I am aware that I contradict the observations of many eminent and respectable physicians.

Doctor Huxham describes an epidemic pleurisy, in the month of March, in the year 1740, which he supposes was produced by his patients feeding upon some corn that had been injured by the rain the August before†. He likewise mentions that a number of people, and those too of the elderly sort‡, were afflicted at one time with worms, in the month of April, in the year 1743.

Lieutade gives an account of an epidemic worm-fever from Velchius, an Italian physician‖; and Sauvages describes, from Vandermonde, an epidemic dysentery from worms, which yielded finally only to worm medicines§. Sir John Pringle, and

* See the Inquiry into the Diseases of the Indians, p. 19.
† Vol. II. of his Epidemics, p. 56.
‡ P. 136.
‖ Vol. I. p. 76.
§ Vol. II. p. 329.

Doctor Monro, likewise frequently mention worms as accompanying the dysentery and remitting fever, and recommend the use of calomel as an antidote to them.

I grant that worms appear more frequently in some epidemic diseases than in others, and oftener in some years than in others. But may not the same heat, moisture, and diet which produced the diseases, have produced the worms? And may not their discharge from the bowels have been occasioned in those epidemics, as in the small-pox and measles, by the increased heat of the body, by the want of nourishment, or by an anthelmintic quality being accidentally combined with some of the medicines that are usually given in fevers?

In answer to this, we are told that we often see the crisis of a fever brought on by the discharge of worms from the bowels by means of a purge, or by an anthelmintic medicine. Whenever this is the case, I believe it is occasioned by offending bile being dislodged by means of the purge, at the same time with the worms, or by the anthelmintic medicine (if not a purge) having been given on, or near one of the usual critical days of the fever. What makes the latter supposition probable is, that worms are seldom suspected in the beginning

of fevers, and anthelmintic medicines seldom given, till every other remedy has failed of success; and this generally happens about the usual time in which fevers terminate in life or death.

It is very remarkable, that since the discovery and description of the hydrocephalus internus, we hear and read much less than formerly of worm-fevers. I suspect that disease of the brain has laid the foundation for the principal part of the cases of worm-fevers which are upon record in books of medicine. I grant that worms sometimes increase the danger from fevers, and often confound the diagnosis and prognosis of them, by a number of new and anomalous symptoms. But here we see nothing more than that complication of symptoms which often occurs in diseases of a very different and opposite nature.

Having rejected worms as the cause of fevers, I proceed to remark, that the diseases most commonly produced by them, belong to Dr. Cullen's class of NEUROSES. And here I might add, that there is scarcely a disease, or a symptom of a disease, belonging to this class, which is not produced by worms. It would be only publishing extracts from books, to describe them.

The *chronic* and *nervous* diseases of children, which are so numerous and frequently fatal, are, I believe, frequently occasioned by worms. There is no great danger, therefore, of doing mischief, by prescribing anthelmintic medicines in all our first attempts to cure their chronic and nervous diseases.

I have been much gratified by finding myself supported in the above theory of worm-fevers, by the late Dr. William Hunter, and by Dr. Butter, in his excellent treatise upon the infantile remitting fever.

I have taken great pains to find out, whether the presence of the different species of worms might not be discovered by certain peculiar symptoms; but all to no purpose. I once attended a girl of twelve years of age in a fever, who discharged four yards of a tænia, and who was so far from having discovered any peculiar symptom of this species of worms, that she had never complained of any other indisposition, than now and then a slight pain in the stomach, which often occurs in young girls from a sedentary life, or from errors in their diet. I beg leave to add further, that there is not a symptom which has been said to indicate the presence of worms of any kind, as the cause of a disease, that has not deceived me; and none oftener

than the one that has been so much depended upon, viz. the picking of the nose. A discharge of worms from the bowels, is, perhaps, the only symptom that is pathognomonic of their presence in the intestines.

I shall now make a few remarks upon anthelmintic remedies.

But I shall first give an account of some experiments which I made in the year 1771, upon the common earth-worm, in order to ascertain the anthelmintic virtues of a variety of substances. I made choice of the earth-worm for this purpose, as it is, according to naturalists, nearly the same in its structure, manner of subsistence, and mode of propagating its species, with the round worm of the human body.

In the first column I shall set down, under distinct heads, the substances in which worms were placed; and in the second and third columns the *time* of their death, from the action of these substances upon them.

I. BITTER AND ASTRINGENT SUBSTANCES.	Hours.	Minutes.
Watery infusion of aloes	2	48
——— of rhubarb	1	30
——— of Peruvian bark	1	30
II. PURGES.		
Watery infusion of jalap	1	—
——— bear's-foot	1	17
——— gamboge	1	—
III. SALTS.		
1. *Acids.*		
Vinegar	—	1½ convulsed.
Lime juice	—	1
Diluted nitrous acid	—	1½
2. *Alkali.*		
A watery solution of salt of tartar	—	2 convulsed, throwing up a mucus on the surface of the water.
3. *Neutral Salts.*		
In a watery solution of common salt	—	1 convulsed.
—— of nitre	—	ditto.
—— of sal diuretic	—	ditto.
—— of sal ammoniac	—	1½
—— of common salt and sugar.	—	4
4. *Earthy and metallic salts.*		
In a watery solution of Epsom salt	—	15½
—— of rock alum	—	10
—— of corrosive sublimate	—	1½ convulsed.
—— of calomel	—	49
—— of turpeth mineral	—	1 convulsed.
—— of sugar of lead	—	3
—— of green vitriol	—	1
—— of blue vitriol	—	10
—— of white vitriol	—	30

	Hours.	Minutes.
IV. METALS.		
Filings of steel	—	2½
Filings of tin	1	—
V. CALCAREOUS EARTH.		
Chalk	2	—
VI. NARCOTIC SUBSTANCES.		
Watery infusion of opium	—	11¼ convulsed.
—— of Carolina pink-root	—	33
—— of tobacco	—	14
VII. ESSENTIAL OILS		
Oil of wormwood	—	3 convulsed.
— of mint	—	3
— of caraway seed	—	3
— of amber	—	1½
— of anniseed	—	4½
— of turpentine	—	6
VIII. ARSENIC.		
A watery solution of white arsenic	near 2	—
IX. FERMENTED LIQUORS.		
In Madeira wine	—	3 convulsed.
Claret	—	10
X. DISTILLED SPIRIT.		
Common rum	—	1 convulsed.
XI. THE FRESH JUICES OF RIPE FRUITS.		
The juice of red cherries	—	5½
——— of black do.	—	5
——— of red currants	—	2½
——— of gooseberries	—	3½
——— of whortleberries	—	12
——— of blackberries	—	7
——— of raspberries	—	5½
——— of plums	—	13
——— of peaches	—	25

	Hours.	Minutes.
The juice of water-melons, no effect	—	—
XII. Saccharine substances.		
Honey	—	7
Molasses	—	7
Brown sugar	—	30
Manna	—	2½
XIII. In aromatic substances.		
Camphor	—	5
Pimento	—	3½
Black pepper	—	45
XIV. Foetid substances		
Juice of onions	—	3½
Watery infusion of assafœtida	—	27
——— Santonicum, or worm seed	1	—
XV. Miscellaneous substances.		
Sulphur mixed with oil	2	—
Æthiops mineral	2	—
Sulphur	2	—
Solution of gunpowder	—	1½
——— of soap	—	19
Oxymel of squills	—	3½
Sweet oil	2	30

In the application of these experiments to the human body, an allowance must always be made for the alteration which the several anthelmintic substances that have been mentioned, may undergo from mixture and diffusion in the stomach and bowels.

In order to derive any benefit from these expe-

riments, as well as from the observations that have been made upon anthelmintic medicines, it will be necessary to divide them into such as act,

1. Mechanically,

2. Chemically upon worms; and,

3. Into those which possess a power composed of chemical and mechanical qualities.

1. The mechanical medicines act indirectly and directly upon the worms.

Those which act *indirectly* are, vomits, purges, bitter and astringent substances, particularly aloes, rhubarb, bark, bear's-foot, and worm-seed. Sweet oil acts indirectly and very feebly upon worms. It was introduced into medicine from its efficacy in destroying the botts in horses; but the worms which infest the human bowels, are of a different nature, and possess very different organs of life from those which are found in the stomach of a horse.

Those mechanical medicines which act *directly* upon the worms, are cowhage* and powder of tin.

* Dolichos Pruriens, of Linnæus.

The last of these medicines has been supposed to act chemically upon the worms, from the arsenic which adheres to it; but from the length of time a worm lived in a solution of white arsenic, it is probable the tin acts altogether mechanically upon them.

2. The medicines which act chemically upon worms, appear, from our experiments, to be very numerous.

Nature has wisely guarded children against the morbid effects of worms, by implanting in them an early appetite for common salt, ripe fruits, and saccharine substances; all of which appear to be among the most speedy and effectual poisons for worms.

Let it not be said, that nature here counteracts her own purposes. Her conduct in this business is conformable to many of her operations in the human body, as well as throughout all her works. The bile is a necessary part of the animal fluids, and yet an appetite for ripe fruits seems to be implanted chiefly to obviate the consequences of its excess, or acrimony, in the summer and autumnal months.

The use of common salt as an anthelmintic medicine, is both ancient and universal. Celsus recommends it. In Ireland it is a common practice to feed children, who are afflicted by worms, for a week or two upon a salt-sea weed, and when the bowels are well charged with it, to give a purge of wort in order to carry off the worms, after they are debilitated by the salt diet.

I have administered many pounds of common salt coloured with cochineal, in doses of half a drachm, upon an empty stomach in the morning, with great success in destroying worms.

Ever since I observed the effects of sugar and other sweet substances upon worms, I have recommended the liberal use of all of them in the diet of children, with the happiest effects. The sweet substances probably act in preventing the diseases from worms in the stomach only, into which they often insinuate themselves, especially in the morning. When we wish to dislodge worms from the bowels by sugar or molasses, we must give these substances in large quantities, so that they may escape in part the action of the stomach upon them.

I can say nothing from my own experience of the efficacy of the mineral salts, composed of cop-

per, iron, and zinc, combined with vitriolic acid, in destroying worms in the bowels. Nor have I ever used the corrosive sublimate in small doses as an anthelmintic.

I have heard of well-attested cases of the efficacy of the oil of turpentine in destroying worms.

The expressed juices of onions and of garlic are very common remedies for worms. From one of the experiments, it appears that the onion juice possesses strong anthelmintic virtues.

I have often prescribed a tea-spoonful of gunpowder in the morning upon an empty stomach, with obvious advantage. The active medicine here is probably the nitre.

I have found a syrup made of the bark of the Jamaica cabbage-tree*, to be a powerful as well as a most agreeable anthelmintic medicine. It sometimes purges and vomits, but its good effects may be obtained without giving it in such doses as to produce these evacuations.

* Geoffrea, of Linnæus.

There is not a more *certain* anthelmintic than Carolina pink-root*. But as there have been instances of death having followed excessive doses of it, imprudently administered, and as children are often affected by giddiness, stupor, and a redness and pain in the eyes after taking it, I acknowledge that I have generally preferred to it, less certain, but more safe medicines for destroying worms.

3. Of the medicines whose action is compounded of mechanical and chemical qualities, calomel, jalap, and the powder of steel, are the principal.

Calomel, in order to be effectual, must be given in large doses. It is a safe and powerful anthelmintic. Combined with jalap, it often brings away worms when given for other purposes.

Of all the medicines that I have administered, I know of none more safe and certain than the simple preparations of iron, whether they be given in the form of steel-filings or of the rust of iron. If ever they fail of success, it is because they are given in too small doses. I generally prescribe from five to thirty grains every morning, to children between one year, and ten years old; and I

* Spigelia Marylandica, of Linnæus.

have been taught by an old sea-captain, who was cured of a tænia by this medicine, to give from two drachms to half an ounce of it, every morning, for three or four days, not only with safety, but with success.

I shall conclude this essay with the following remarks:

1. Where the action of medicines upon worms in the bowels does not agree exactly with their action upon the earth-worms in the experiments that have been related, it must be ascribed to the medicines being more or less altered by the action of the stomach upon them. I conceive that the superior anthelmintic qualities of pink-root, steel-filings, and calomel (all of which acted but slowly upon the earth-worms compared with many other substances) are in a great degree occasioned by their escaping the digestive powers unchanged, and acting in a concentrated state upon the worms.

2. In fevers attended with anomalous symptoms, which are supposed to arise from worms, I have constantly refused to yield to the solicitations of my patients, to abandon the indications of cure in the fever, and to pursue worms as the *principal* cause of the disease. While I have adhered stea-

dily to the usual remedies for the different states of fever, in all their stages, I have at the same time blended those remedies occasionally with anthelmintic medicines. In this I have imitated the practice of physicians in many other diseases, in which troublesome and dangerous symptoms are pursued, without seducing the attention from the original disease. The anthelmintic medicines prescribed in these cases, should not be the rust of iron, and common salt, which are so very useful in chronic diseases from worms, but calomel and jalap, and such other medicines as aid in the cure of fevers.

AN ACCOUNT

OF THE

EXTERNAL USE OF ARSENIC,

IN THE

CURE OF CANCERS.

AN ACCOUNT, &c.

A FEW years ago, a certain Doctor Hugh Martin, a surgeon of one of the Pennsylvania regiments stationed at Pittsburg, during the latter part of the late war, came to this city, and advertised to cure cancers with a medicine which he said he had discovered in the woods, in the neighbourhood of the garrison. As Dr. Martin had once been my pupil, I took the liberty of waiting upon him, and asked him some questions respecting his discovery. His answers were calculated to make me believe, that his medicine was of a vegetable nature, and that it was originally an Indian remedy. He showed me some of the medicine, which appeared to be the powder of a well-dried root of some kind. Anxious to see the success of this medicine in cancerous sores, I prevailed upon the doctor to admit me to see him apply it in two or

three cases. I observed, in some instances, he applied a powder to the parts affected, and in others only touched them with a feather dipped in a liquid which had a white sediment, and which he made me believe was the vegetable root diffused in water. It gave me great pleasure to witness the efficacy of the doctor's applications. In several cancerous ulcers, the cures he performed were complete. Where the cancers were much connected with the lymphatic system, or accompanied with a scrophulous habit of body, his medicine always failed, and, in some instances, did evident mischief.

Anxious to discover a medicine that promised relief in even a few cases of cancers, and supposing that all the caustic vegetables were nearly alike, I applied the phytolacca or poke-root, the stramonium, the arum, and one or two others, to foul ulcers, in hopes of seeing the same effects from them which I had seen from Doctor Martin's powder; but in these I was disappointed. They gave some pain, but performed no cures. At length I was furnished by a gentleman from Pittsburg with a powder which I had no doubt, from a variety of circumstances, was of the same kind as that used by Dr. Martin. I applied it to a fungous ulcer, but without producing the de-

grees of pain, inflammation, or discharge, which I had been accustomed to see from the application of Dr. Martin's powder. After this, I should have suspected that the powder was not a *simple* root, had not the doctor continued upon all occasions to assure me, that it was wholly a vegetable preparation.

In the beginning of the year 1784, the doctor died, and it was generally believed that his medicine had died with him. A few weeks after his death I procured, from one of his administrators, a few ounces of the doctor's powder, partly with a view of applying it to a cancerous sore which then offered, and partly with a view of examining it more minutely than I had been able to do during the doctor's life. Upon throwing the powder, which was of a brown colour, upon a piece of white paper, I perceived distinctly a number of white particles scattered through it. I suspected at first that they were corrosive sublimate, but the usual tests of that metallic salt soon convinced me, that I was mistaken. Recollecting that arsenic was the basis of most of the celebrated cancer powders that have been used in the world, I had recourse to the tests for detecting it. Upon sprinkling a small quantity of the powder upon some coals of fire, it emitted the garlick smell so per-

ceptibly as to be known by several persons whom I called into the room where I made the experiment, and who knew nothing of the object of my inquiries. After this, with some difficulty I picked out about three or four grains of the white powder, and bound them between two pieces of copper, which I threw into the fire. After the copper pieces became red hot, I took them out of the fire, and when they had cooled, discovered an evident whiteness imparted to both of them. One of the pieces afterwards looked like dull silver. These two tests have generally been thought sufficient to distinguish the presence of arsenic in any bodies; but I made use of a third, which has lately been communicated to the world by Mr. Bergman, and which is supposed to be in all cases infallible.

I infused a small quantity of the powder in a solution of a vegetable alkali in water for a few hours, and then poured it upon a solution of blue vitriol in water. The colour of the vitriol was immediately changed to a beautiful green, and afterwards precipitated.

I shall close this paper with a few remarks upon this powder, and upon the cure of cancers and foul ulcers of all kinds.

1. The use of caustics in cancers and foul ulcers is very ancient, and universal. But I believe *arsenic* to be the most efficacious of any that has ever been used. It is the basis of Plunket's and probably of Guy's well-known cancer powders. The great art of applying it successfully, is to dilute and mix it in such a manner as to mitigate the violence of its action. Doctor Martin's composition was happily calculated for this purpose. It gave less pain than the common or lunar caustic. It excited a moderate inflammation, which separated the morbid from the sound parts, and promoted a plentiful afflux of humours to the sore during its application. It seldom produced an escar; hence it insinuated itself into the deepest recesses of the cancers, and frequently separated those fibres in an unbroken state, which are generally called the roots of the cancer. Upon this account, I think, in some ulcerated cancers it is to be preferred to the knife. It has no action upon the sound skin. This Doctor Hall proved, by confining a small quantity of it upon his arm for many hours. In those cases where Doctor Martin used it to extract cancerous or schirrous tumours that were not ulcerated, I have reason to believe that he always broke the skin with Spanish flies.

2. The arsenic used by the doctor was the pure white arsenic. I should suppose from the examination I made of the powder with the eye, that the proportion of arsenic to the vegetable powder, could not be more than one-fortieth part of the whole compound. I have reason to think that the doctor employed different vegetable substances at different times. The vegetable matter with which the arsenic was combined in the powder which I used in my experiments, was probably nothing more than the powder of the root and berries of the solanum lethale, or deadly nightshade. As the principal, and perhaps the only design of the vegetable addition was to blunt the activity of the arsenic, I should suppose that the same proportion of common wheat flour as the doctor used of his caustic vegetables, would answer nearly the same purpose. In those cases where the doctor applied a feather dipped in a liquid to the sore of his patient, I have no doubt but his phial contained nothing but a weak solution of arsenic in water. This is no new method of applying arsenic to foul ulcers. Doctor Way of Wilmington has spoken in the highest terms to me of a wash for foulnesses on the skin, as well as old ulcers, prepared by boiling an ounce of white arsenic in two quarts of water to three pints, and applying it once or twice a day.

3. I mentioned, formerly, that Doctor Martin was often unsuccessful in the application of his powder. This was occasioned by his using it indiscriminately in *all* cases. In schirrous and cancerous tumours, the knife should always be preferred to the caustic. In cancerous ulcers attended with a scrophulous or a bad habit of body, such particularly as have their seat in the neck, in the breasts of females, and in the axillary glands, it can only protract the patient's misery. Most of the cancerous sores cured by Doctor Martin were seated on the nose, or cheeks, or upon the surface or extremities of the body. It remains yet to discover a cure for cancers that taint the fluids, or infect the whole lymphatic system. This cure I apprehend must be sought for in diet, or in the long use of some internal medicine.

To pronounce a disease incurable, is often to render it so. The intermitting fever, if left to itself, would probably prove frequently, and perhaps more speedily fatal than cancers. And as cancerous tumours and sores are often neglected, or treated improperly by injudicious people, from an apprehension that they are incurable (to which the frequent advice of physicians " to let them " alone," has no doubt contributed), perhaps the introduction of arsenic into regular practice as a

remedy for cancers, may invite to a more early application to physicians, and thereby prevent the deplorable cases that have been mentioned, which are often rendered so by delay or unskilful management.

4. It is not in cancerous sores only that Doctor Martin's powder has been found to do service. In sores of all kinds, and from a variety of causes, where they have been attended with fungous flesh or callous edges, I have used the doctor's powder with advantage.

I flatter myself that I shall be excused in giving this detail of a *quack* medicine, when we reflect that it was from the inventions and temerity of quacks, that physicians have derived some of their most active and most useful medicines.

OBSERVATIONS

UPON

THE TETANUS.

OBSERVATIONS, &c.

FOR a history of the different names and symptoms of this disease, I beg leave to refer the reader to practical books, particularly to Doctor Cullen's First Lines. My only design in this inquiry, is to deliver such a theory of the disease, as may lead to a new and successful use of old and common remedies for it.

All the remote and predisposing causes of the tetanus act by inducing preternatural debility, and irritability in the muscular parts of the body. In many cases, the remote causes act alone, but they more frequently require the co-operation of an exciting cause. I shall briefly enumerate, without discriminating them, or pointing out when they act singly, or when in conjunction with each other.

I. Wounds on different parts of the body are the most frequent causes of this disease. It was formerly supposed it was the effect only of a wound, which partially divided a tendon, or a nerve; but we now know it is often the consequence of læsions which affect the body in a superficial manner. The following is a list of such wounds and læsions as have been known to induce the disease:

1. Wounds in the soles of the feet, in the palms of the hands, and under the nails, by means of nails or splinters of wood.

2. Amputations, and fractures of limbs.

3. Gun-shot wounds.

4. Venesection.

5. The extraction of a tooth, and the insertion of new teeth.

6. The extirpation of a schirrus.

7. Castration.

8. A wound on the tongue.

9. The injury which is done to the feet by frost.

10. The injury which is sometimes done to one of the toes, by stumping it (as it is called) in walking.

11. Cutting a nail too closely. Also,

12. Cutting a corn too closely.

13. Wearing a shoe so tight as to abrade the skin of one of the toes.

14. A wound, not more than an eighth part of an inch, upon the forehead.

15. The stroke of a whip upon the arm, which only broke the skin.

16. Walking too soon upon a broken limb.

17. The sting of a wasp upon the glands penis.

18. A fish bone sticking in the throat.

19. Cutting the navel string in new-born infants.

Between the time in which the body is thus wounded or injured, and the time in which the disease makes its appearance, there is an interval which extends from one day to six weeks. In the person who injured his toe by stumping it in walking, the disease appeared the next day. The trifling wound on the forehead which I have mentioned, produced both tetanus and death, the day after it was received. I have known two instances of tetanus, from running nails in the feet, which did not appear until six weeks afterwards. In most of the cases of this disease from wounds which I have seen, there was a total absence of pain and inflammation, or but very moderate degrees of them, and in some of them the wounds had entirely healed, before any of the symptoms of the disease had made their appearance. Wounds and læsions are most apt to produce tetanus, after the long continued application of heat to the body; hence its greater frequency, from these causes, in warm than in cold climates, and in warm than in cold weather, in northern countries.

II. Cold applied suddenly to the body, after it has been exposed to intense heat. Of this Dr. Girdlestone mentions many instances, in his Treatise upon Spasmodic Affections in India. It was most commonly induced by sleeping upon the

ground, after a warm day. Such is the dampness and unwholesome nature of the ground, in some parts of that country, that " fowls (the doctor says) put into coops at night, in the sickly season of the year, and on the same soil that the men slept, were always found dead the next morning, if the coop was not placed at a certain height above the surface of the earth*." It was brought on by sleeping on a damp pavement in a servant girl of Mr. Alexander Todd of Philadelphia, in the evening of a day in which the mercury in Fahrenheit's thermometer stood at 90°. Dr. Chalmers relates an instance of its having been induced by a person's sleeping without a nightcap, after shaving his head. The late Dr. Bartram informed me, that he had known a draught of cold water produce it in a man who was in a preternaturally heated state. The cold air more certainly brings on this disease, if it be applied to the body in the form of a current. The stiff neck which is sometimes felt after exposure to a stream of cool air from an open window, is a tendency to a locked jaw, or a feeble and partial tetanus.

III. Worms and certain acrid matters in the alimentary canal. Morgagni relates an instance of

* Page 55.

the former, and I shall hereafter mention instances of the latter in new-born infants.

IV. Certain poisonous vegetables. There are several cases upon record of its being induced by the hemlock dropwort, and the datura stramonium, or Jamestown weed of our country.

V. It is sometimes a symptom of the bilious remitting and intermitting fever. It is said to occur more frequently in those states of fever in the island of Malta, than in any other part of the world.

VI. It is likewise a symptom of that malignant state of fever which is brought on by the bite of a rabid animal, also of hysteria and gout.

VII. The grating noise produced by cutting with a knife upon a pewter plate excited it in a servant, while he was waiting upon his master's table in London. It proved fatal in three days.

VIII. The sight of food, after long fasting.

IX. Drunkenness.

X. Certain emotions and passions of the mind. Terror brought it on a brewer in this city. He

had been previously debilitated by great labour, in warm weather. I have heard of its having been induced in a man by agitation of mind, occasioned by seeing a girl tread upon a nail. Fear excited it in a soldier who kneeled down to be shot. Upon being pardoned he was unable to rise, from a sudden attack of tetanus. Grief produced it in a case mentioned by Dr. Willan.

XI. Parturition.

All these remote and exciting causes act with more or less certainty and force, in proportion to the greater or less degrees of fatigue which have preceded them.

It has been customary with authors to call all those cases of tetanus, which are not brought on by wounds, symptomatic. They are no more so than those which are said to be idiopathic. They all depend alike upon irritating impressions, made upon one part of the body, producing morbid excitement, or disease in another. It is immaterial, whether the impression be made upon the intestines by a worm, upon the ear by an ungrateful noise, upon the mind by a strong emotion, or upon the sole of the foot by a nail; it is alike commu-

nicated to the muscles, which, from their previous debility and irritability, are thrown into commotions by it. In yielding to the impression of irritants, they follow in their contractions the order of their predisposing debility. The muscles which move the lower jaw are affected more early, and more obstinately than any of the other external muscles of the body, only because they are more constantly in a relaxed, or idle state.

The negroes in the West-Indies are more subject to this disease than white people. This has been ascribed to the greater irritability of their muscular systems, which constitutes a part of its predisposing cause. It is remarkable that their sensibility lessens with the increase of their irritability; and hence, Dr. Moseley says, they bear surgical operations much better than white people.

New-born infants are often affected by this disease in the West-Indies. I have seen a few cases of it in Philadelphia. It is known by the name of the jaw-fall. Its causes are:

1. The cutting of the navel string. This is often done with a pair of dull scissars, by which means the cord is bruised.

2. The acrimony of the meconium retained in the bowels.

3. Cold air acting upon the body, after it has been heated by the air of a hot room.

4. Smoke is supposed to excite it, in the negro quarters in the West-Indies.

It is unknown, Dr. Winterbottom informs us, among the native Africans in the neighbourhood of Sierra Leone.

I am aware that it is ascribed by many physicians to only one of the above causes; but I see no reason why it should not be induced by more than one cause in infants, when we see it brought on by so many different causes in grown people.

The tetanus is not confined to the human species. It often affects horses in the West-Indies. I have seen several cases of it in Philadelphia.

The want of uniform success in the treatment of this disease, has long been a subject of regret among physicians. It may be ascribed to the use of the same remedies, without any respect to the nature of the causes which produce it, and to an

undue reliance upon some one remedy, under a belief of its specific efficacy. Opium has been considered as its antidote, without recollecting that it was one only, of a numerous class of medicines, that are all alike useful in it.

Tetanus, from all its causes, has nearly the same premonitory symptoms. These are a stiffness in the neck, a disposition to bend forward, in order to relieve a pain in the back, costiveness, a pain about the external region of the stomach, and a disposition to start in sleep. In this feeble state of the disease, an emetic, a strong dose of laudanum, the warm bath, or a few doses of bark, have often prevented its being completely formed. When it has arisen from a wound, dilating it if small or healed, and afterwards inflaming it, by applying to it turpentine, common salt, corrosive sublimate, or Spanish flies, have, in many hundred instances, been attended with the same salutary effects.

The disease I have said is seated in the muscles, and, while they are preternaturally excited, the blood-vessels are in a state of reduced excitement. This is evident from the feebleness and slowness of the pulse. It sometimes beats, according to Dr. Lining, but forty strokes in a minute. By stimulating the wound, we not only restore the

natural excitement of the blood-vessels, but we produce an inflammatory diathesis in them, which abstracts morbid excitement from the muscular system, and, by equalizing it, cures the disease. This remedy I acknowledge has not been as successfully employed in the West-Indies as in the United States, and that for an obvious reason. The blood-vessels in a warm climate refuse to assume an inflammatory action. Stimuli hurry them on suddenly to torpor or gangrene. Hence the danger and even fatal effects of blood-letting, in the fevers which affect the natives of the islands, a few hours after they are formed. But widely different is the nature of wounds, and of the tension of the blood-vessels, in the inhabitants of northern countries. While Dr. Dallas deplores the loss of 49 out of 50 affected with tetanus from wounds, in the West-India islands, I am sure I could mention many hundred instances of the disease being prevented, and a very different proportion of cures being performed, by inflaming the wounds, and exciting a counter *morbid* action in the blood-vessels.

When the disease is the effect of fever, the same remedies should be given, as are employed in the cure of that fever. I have once unlocked the jaw of a woman who was seized at the same

time with a remitting fever, by an emetic, and I have heard of its being cured in a company of surveyors, in whom it was the effect of an intermittent, by large doses of bark. When it accompanies malignant fever, hysteria, or gout, the remedies for those forms of disease should be employed. Bleeding was highly useful in it in a case of yellow fever which occurred in Philadelphia in the year 1794.

When it is produced by the suppression of perspiration by means of cold, the warm bath and sweating medicines have been found most useful in it. Nature has in one instance pointed out the use of this remedy, by curing the disease by a miliary eruption on the skin*.

If it be the effect of poisonous substances taken into the stomach, or of worms in the bowels, the cure should be begun by emetics, purges, and anthelmintic medicines.

Where patients are unable to swallow, from the teeth of the upper and lower jaw pressing upon each other, a tooth or two should be extracted, to open a passage for our medicines into the throat.

* Burserus.

If this be impracticable or objected to, they should be injected by way of glyster.

In the locked jaw which arises from the extraction of a tooth, an instrument should be introduced to depress the jaw. This has been done by a noted English dentist in London, with success.

As the habit of diseased action often continues after the removal of its causes, and as some of the remote causes of this disease are beyond the reach of medicine, such remedies should be given as are calculated, by their stimulating power, to overcome the morbid or spasmodic action of the muscles. These are:

1. Opium. It should be given in large and frequent doses. Dr. Stultz says he has found from one to two drachms of an alkali, taken in the course of a day, greatly to aid the action of the opium in this disease.

2. Wine. This should be given in quarts, and even gallons, daily. Dr. Currie relates a case of a man in the infirmary of Liverpool, who was cured of tetanus, by drinking nearly a quarter cask of Madeira wine. Dr. Hosack speaks in high terms of it, in a letter to Dr. Duncan, and advises its

being given without any other stimulating medicine.

3. ARDENT SPIRITS. A quack in New-England has lately cured tetanus, by giving ardent spirits in such quantities as to produce intoxication. Upon being asked his reason for this strange practice, he said, he had always observed the jaw to fall in drunken men, and any thing that would produce that effect, he supposed to be proper in the locked jaw.

4. The BARK has of late years been used in this disease with success. I had the pleasure of first seeing its good effects in the case of Colonel Stone, in whom a severe tetanus followed a wound in the foot, received at the battle of Germantown, in October, 1777.

5. The COLD BATH. This remedy has been revived by Dr. Wright of Jamaica, and has in many instances performed cures of this disease. In one of two cases in which I have used it with success, the patient's jaw opened in a few minutes after the affusion of a single bucket of water upon her body. The disease was occasioned by a slight injury done to one of her toes, by wearing a tight shoe. The signals for continuing the use of the cold bath, are

its being followed by a slight degree of fever, and a general warmth of the skin. Where these do not occur, there is reason to believe it will do no service, or perhaps do harm. We have many proofs of the difference in the same disease, and in the operation of the same medicine, in different and opposite climates. Dr. Girdlestone has mentioned the result of the use of the cold bath in tetanus in the East-Indies, which furnishes a striking addition to the numerous facts that have been collected upon that subject. He tells us the cold bath uniformly destroyed life, in every case in which it was used. The reason is obvious. In that extremely debilitating climate, the system in tetanus was prostrated too low to re-act, under the sedative operation of the cold water.

6. The WARM BATH has often been used with success in this disease. Its temperature should be regulated by our wishes to promote sweats, or to produce excitement in the blood-vessels. In the latter case it should rise above the heat of the human body.

7. The OIL OF AMBER acts powerfully upon the muscular system. I have seen the happiest effects from the exhibition of six or eight drops of it, every two hours, in this disease.

8. A SALIVATION has been often recommended for the cure of tetanus, but unfortunately it can seldom be excited in time to do service. I once saw it complete the cure of a sailor in the Pennsylvania hospital, whose life was prolonged by the alternate use of bark and wine. The disease was brought on him by a mortification of his feet, in consequence of their being frost-bitten.

9. Dr. Girdlestone commends BLISTERS in high terms in this disease. He says he never saw it prove fatal, even where they only produced a redness on the skin.

10. I have heard of ELECTRICITY having been used with advantage in tetanus, but I can say nothing in its favour from my own experience.

In order to ensure the utmost benefit from the use of the above remedies, it will be necessary for a physician always to recollect, that the disease is attended with great morbid action, and of course each of the stimulating medicines that has been mentioned should be given, 1st, in large doses; 2dly, in succession; 3dly, in rotation; and 4thly, by way of glyster, as well as by the mouth.

The jaw-fall in new-born infants is, I believe, alwavs fatal. Purging off the meconium from the bowels immediately after birth has often prevented it from one of its causes; and applying a rag wetted with spirit of turpentine to the navel-string, immediately after it is cut, Dr. Chisholm says, prevents it from another of its causes which has been mentioned.

This disease, I have said, sometimes affects horses. I have twice seen it cured by applying a potential caustic to the neck under the mane, by large doses of the oil of amber, and by plunging one of them into a river, and throwing buckets of cold water upon the other.

I shall conclude my observations upon the tetanus with the following queries:

1. What would be the effects of *copious* bloodletting in this disease? There is a case upon record of its efficacy, in the Medical Journal of Paris, and I have now in my possession a letter from the late Dr. Hopkins of Connecticut, containing the history of a cure performed by it. Where tetanus is the effect of primary gout, hysteria, or fever, attended with highly inflammatory symptoms, bleeding is certainly indicated, but, in general, the dis-

ease is so completely insulated in the muscles, and the arteries are so far below their par of excitement in frequency and force, that little benefit can be expected from that remedy. The disease, in these cases, seems to call for an elevation, instead of a diminution, of the excitement of the blood-vessels.

2. What would be the effect of *extreme* cold in this disease? Mr. John Hunter used to say, in his lectures, "Were he to be attacked by it, he would, if possible, fly to Nova-Zembla, or throw himself into an ice-house." I have no doubt of the efficacy of intense cold, in subduing the inordinate morbid actions which occur in the muscular system; but it offers so much violence to the fears and prejudices of sick people, or their friends, that it can seldom be applied in such a manner as to derive much benefit from it. Perhaps the sedative effects of cold might be obtained with less difficulty, by wrapping the body in sheets, and wetting them occasionally for an hour or two with cold water.

3. What would be the effect of exciting a strong counter-action in the stomach and bowels in this disease? Dr. Brown of Kentucky cured a tetanus by inflaming the stomach, by means of the tincture

of cantharides. It has likewise been cured by a severe cholera morbus, induced by a large dose of corrosive sublimate. The stomach and bowels, and the external muscles of the body, discover strong associations in many diseases. A sick stomach is always followed by general weakness, and the dry gripes often paralyze the muscles of the arms and limbs. But further, one of the remote causes of tetanus, viz. cold air, often shows the near relationship of the muscles to the bowels, and the vicarious nature of disease in each of them. It often produces in the latter, in the West-Indies, what the French physicians call a "crampe seche," or, in other words, if I may be allowed the expression, a tetanus in the bowels.

4. A sameness has been pointed out between many of the symptoms of hydrophobia and tetanus. A similar difficulty of swallowing, and similar convulsions after it, have been remarked in both diseases. Death often takes place suddenly in tetanus, as it does in hydrophobia, without producing marks of fatal disorganization in any of the internal parts of the body. Dr. Physick supposes death in these cases to be the effect of suffocation, from a sudden spasm and closure of the glottis, and proposes to prevent it in the same manner that he has proposed to prevent death from hydropho-

bia, that is, by laryngotomy*. The prospect of success from it appears alike reasonable in both cases.

* Medical Repository.

THE RESULT OF OBSERVATIONS

MADE UPON

THE DISEASES

WHICH OCCURRED IN

THE MILITARY HOSPITALS

OF THE UNITED STATES,

DURING THE REVOLUTIONARY WAR BETWEEN GREAT BRITAIN AND THE UNITED STATES.

RESULT OF OBSERVATIONS, &c.

1. THE army when in tents, was always more sickly, than in the open air. It was likewise more healthy when it was kept in motion, than when it lay in an encampment.

2. Young men under twenty years of age, were subject to the greatest number of camp diseases.

3. The southern troops were more sickly than the northern or eastern troops.

4. The native Americans were more sickly than the natives of Europe who served in the American army.

5. Men above thirty, and five and thirty years of age, were the hardiest soldiers in the army. Perhaps the reason why the natives of Europe

were more healthy than the native Americans, was, they were more advanced in life.

6. The southern troops sickened from the want of salt provisions. Their strength and spirits were restored only by means of salted meat. I once saw a private in a Virginia regiment, throw away his ration of choice fresh beef, and give a dollar for a pound of salted bacon.

7. Those officers who wore flannel shirts or waistcoats next to their skins, in general escaped fevers and diseases of all kinds.

8. The principal diseases in the hospitals were the typhus gravior and mitior of Doctor Cullen. Men who came into the hospitals with pleurisies or rheumatisms, soon lost the types of their original diseases, and suffered, or died, by the above-mentioned states of fever.

9. The typhus mitior always prevailed most, and with the worst symptoms in winter. A free air, which could only be obtained in summer, always prevented, or mitigated it.

10. In all those cases, where the contagion was received, cold seldom failed to render it ac-

tive. Whenever an hospital was removed in winter, one half of the patients generally sickened on the way, or soon after their arrival at the place to which they were sent.

11. Drunken soldiers and convalescents were most subject to this fever.

12. Those patients in this fever who had large ulcers on their back or limbs, generally recovered.

13. I met with several instances of buboes, also of ulcers in the throat, as described by Doctor Donald Monro. They were mistaken by some of the junior surgeons for venereal sores, but they yielded to the common remedies of the hospital fever.

14. There were many instances of patients in this fever, who suddenly fell down dead, upon being moved, without any previous symptoms of approaching dissolution. This was more especially the case, when they arose to go to stool.

16. The contagion of this fever was frequently conveyed from the hospital to the camp, by means of blankets and clothes.

16. Those black soldiers who had been previously slaves, died in a greater proportion by this fever, or had a much slower recovery from it, than the same number of white soldiers.

17. The remedies which appeared to do most service in this disease were vomits of tartar emetic, gentle dozes of laxative salts, bark, wine, volatile salt, opium, and blisters.

18. An emetic seldom failed of checking this fever if exhibited while it was in a *forming* state, and before the patient was confined to his bed.

19. Many causes concurred to produce, and increase this fever; such as the want of cleanliness, excessive fatigue, the ignorance or negligence of officers in providing suitable diet and accommodations for their men, the general use of linen instead of woollen clothes in the summer months, and the crowding too many patients together in one hospital, with such other inconveniences and abuses, as usually follow the union of the *purveying* and *directing* departments of hospitals in the *same* persons. But there is one more cause of this fever which remains to be mentioned, and that is, the sudden assembling of a great number of persons together of different habits and manners, such

as the soldiers of the American army were in the years 1776 and 1777. Doctor Blane informs us, in his observations upon the diseases of seamen, "that it sometimes happens that a ship with a "long established crew shall be very *healthy*, yet "if strangers are introduced among them, who "are also *healthy*, sickness will be mutually pro-"duced." The history of diseases furnishes many proofs of the truth of this assertion*. It is very remarkable, that while the American army at Cambridge, in the year 1775, consisted only of New-Englandmen (whose habits and manners were the same) there was scarcely any sickness among them. It was not till the troops of the eastern, middle, and southern states met at New-York and Ticonderoga, in the year 1776, that the typhus became universal, and spread with such peculiar mortality in the armies of the United States.

20. The dysentery prevailed, in the summer of 1777, in the military hospitals of New-Jersey, but

* "Cleanliness is founded on a natural aversion to what is unseemly and offensive in the persons of others; and there seems also to be an instinctive horror at strangers implanted in human nature for the same purpose, as is visible in young children, and uncultivated people. In the early ages of Rome, the same word signified both a stranger and an enemy." Dr. Blane, p. 225.

with very few instances of mortality. This dysentery was frequently followed by an obstinate diarrhœa, in which the warm bath was found in many cases to be an effectual remedy.

21. I saw several instances of fevers occasioned by the use of the common ointment made of the flour of sulphur and hog's lard, for the cure of the itch. The fevers were probably brought on by the exposure of the body to the cold air, in the usual method in which that ointment is applied. I have since learned, that the itch may be cured as speedily by rubbing the parts affected, two or three times, with the dry flour of sulphur, and that no inconvenience, and scarcely any smell, follow this mode of using it.

22. In gun-shot wounds of the joints, Mr. Ranby's advice of amputating the limb was followed with success. I saw two cases of death where this advice was neglected.

23. There was one instance of a soldier who lost his hearing, and another of a soldier who had been deaf who recovered his hearing, by the noise of artillery in a battle.

24. Those soldiers who were billetted in private houses, generally escaped the hospital fever, and recovered soonest from all their diseases.

25. Hospitals built of coarse logs, with *ground* floors, with fire-places in the middle of them, and a hole in the roof, for the discharge of smoke, were found to be very conducive to the recovery of the soldiers from the hospital fever. This form of a military hospital was introduced into the army by Dr. Tilton of the state of Delaware*.

26. In fevers and dysenteries, those soldiers recovered most certainly, and most speedily, who lay at the greatest distance from the walls of the hospitals. This important fact was communicated to me by the late Dr. Beardsley of Connecticut.

27. Soldiers are but little more than adult children. That officer, therefore, will best perform his duty to his men, who obliges them to take the most care of their HEALTH.

* "It is proved, in innumerable instances, that sick men recover health sooner and better in sheds, huts, and barns, exposed occasionally to wind, and sometimes to rain, than in the most superb hospitals in Europe." Jackson's Remarks on the Constitution of the Medical Department of the British Army, p. 340.

28. Hospitals are the sinks of human life in an army. They robbed the United States of more citizens than the sword. Humanity, economy, and philosophy, all concur in giving a preference to the conveniences and wholesome air of private houses; and should war continue to be the absurd and unchristian mode of deciding national disputes, it is to be hoped that the progress of science will so far mitigate one of its greatest calamities, as to produce an abolition of hospitals for acute diseases. Perhaps there are no cases of sickness in which reason and religion do not forbid the seclusion of our fellow creatures from the offices of humanity in private families, except where they labour under the calamities of madness and the venereal disease, or where they are the subjects of some of the operations of surgery.

AN ACCOUNT OF THE INFLUENCE

OF THE

MILITARY AND POLITICAL EVENTS

OF THE

AMERICAN REVOLUTION

UPON THE

HUMAN BODY.

AN ACCOUNT, &c.

THERE were several circumstances peculiar to the American revolution, which should be mentioned previously to an account of the influence of the events which accompanied it, upon the human body.

1. The revolution interested every inhabitant of the country of both sexes, and of every rank and age that was capable of reflection. An indifferent, or neutral spectator of the controversy, was scarcely to be found in any of the states.

2. The scenes of war and government which it introduced, were new to the greatest part of the inhabitants of the United States, and operated with all the force of *novelty* upon the human mind.

3. The controversy was conceived to be the most important of any that had ever engaged the attention of mankind. It was generally believed, by the friends of the revolution, that the very existence of *freedom* upon our globe, was involved in the issue of the contest in favour of the United States.

4. The American revolution included in it the cares of government, as well as the toils and dangers of war. The American mind was, therefore, frequently occupied at the *same time*, by the difficult and complicated duties of political and military life.

5. The revolution was conducted by men who had been born *free*, and whose sense of the blessings of liberty was of course more exquisite than if they had just emerged from a state of slavery.

6. The greatest part of the soldiers in the armies of the United States had family connections and property in the country.

7. The war was carried on by the Americans against a nation, to whom they had long been tied by the numerous obligations of consanguinity, laws, religion, commerce, language, interest, and a mu-

tual sense of national glory. The resentments of the Americans of course rose, as is usual in all disputes, in proportion to the number and force of these ancient bonds of affection and union.

8. A predilection to a limited monarchy, as an essential part of a free and safe government, and an attachment to the reigning king of Great-Britain (with a very few exceptions), were universal in every part of the United States.

9. There was at one time a sudden dissolution of civil government in *all*, and of ecclesiastical establishments in several of the states.

10. The expences of the war were supported by means of a paper currency, which was continually depreciating.

From the action of each of these causes, and frequently from their combination in the same persons, effects might reasonably be expected, both upon the mind and body, which have seldom occurred; or if they have, I believe were never fully recorded in any age or country.

It might afford some useful instruction, to point out the influence of the military and political events

of the revolution upon the understandings, passions, and morals of the citizens of the United States; but my business in the present inquiry, is only to take notice of the influence of those events upon the human body, through the medium of the mind.

I shall first mention the effects of the military, and secondly, of the political events of the revolution. The last must be considered in a two-fold view, accordingly as they affected the friends, or the enemies of the revolution.

I. In treating of the effects of the military events, I shall take notice, first, of the influence of *actual* war, and, secondly, of the influence of the military life.

In the beginning of a battle, I have observed *thirst* to be a very common sensation among both officers and soldiers. It occurred where no exercise, or action of the body, could have excited it.

Many officers have informed me, that after the first onset in a battle, they felt a glow of heat, so universal as to be perceptible in both their ears. This was the case, in a particular manner, in the battle of Princeton, on the third of January, in the

year 1777, on which day the weather was remarkably cold.

A veteran colonel of a New-England regiment, whom I visited at Princeton, and who was wounded in the hand at the battle of Monmouth, on the 28th of June, 1778 (a day in which the mercury stood at 90° of Fahrenheit's thermometer), after describing his situation at the time he received his wound, concluded his story by remarking, that "fighting was hot work on a cold day, but much "more so on a warm day." The many instances which appeared after that memorable battle, of soldiers who were found among the slain without any marks of wounds or violence upon their bodies, were probably occasioned by the heat excited in the body, by the emotions of the mind, being added to that of the atmosphere.

Soldiers bore operations of every kind immediately *after* a battle, with much more fortitude than they did at *any time* afterwards.

The effects of the military life upon the human body come next to be considered under this head.

In another place* I have mentioned three cases

* Page 204.

of pulmonary consumption being perfectly cured by the diet and hardships of a camp life.

Doctor Blane, in his valuable observations on the diseases incident to seamen, ascribes the extraordinary healthiness of the British fleet in the month of April, 1782, to the effects produced on the spirit of the soldiers and seamen, by the victory obtained over the French fleet on the 12th of that month; and relates, upon the authority of Mr. Ives, an instance in the war between Great-Britain and the combined powers of France and Spain, in 1744, in which the scurvy, as well as other diseases, were checked by the prospect of a naval engagement.

The American army furnished an instance of the effects of victory upon the human mind, which may serve to establish the inferences from the facts related by Doctor Blane. The Philadelphia militia who joined the remains of General Washington's army, in December, 1776, and shared with them a few days afterwards in the capture of a large body of Hessians at Trenton, consisted of 1500 men, most of whom had been accustomed to the habits of a city life. These men slept in tents and barns, and sometimes in the open air during the usual colds of December and January;

and yet there were but two instances of sickness, and only one of death, in that body of men in the course of nearly six weeks, in those winter months. This extraordinary healthiness of so great a number of men under such trying circumstances, can only be ascribed to the vigour infused into the human body by the victory of Trenton having produced insensibility to all the usual remote causes of diseases.

Militia officers and soldiers, who enjoyed good health during a campaign, were often affected by fevers and other diseases, as soon as they returned to their respective homes. I knew one instance of a militia captain, who was seized with convulsions the first night he lay on a feather bed, after sleeping several months on a mattrass, or upon the ground. These affections of the body appeared to be produced only by the sudden abstraction of that tone in the system which was excited by a sense of danger, and the other invigorating objects of a military life.

The NOSTALGIA of Doctor Cullen, or the *home-sickness*, was a frequent disease in the American army, more especially among the soldiers of the New-England states. But this disease was suspended by the superior action of the mind un-

der the influence of the principles which governed common soldiers in the American army. Of this General Gates furnished me with a remarkable instance in 1776, soon after his return from the command of a large body of regular troops and militia at Ticonderoga. From the effects of the nostalgia, and the feebleness of the discipline, which was exercised over the militia, desertions were very frequent and numerous in his army, in the latter part of the campaign; and yet during the *three weeks* in which the general expected every hour an attack to be made upon him by General Burgoyne, there was not a single desertion from his army, which consisted at that time of 10,000 men.

The patience, firmness, and magnanimity with which the officers and soldiers of the American army endured the complicated evils of hunger, cold, and nakedness, can only be ascribed to an insensibility of body produced by an uncommon tone of mind excited by the love of liberty and their country.

Before I proceed to the second general division of this subject, I shall take notice, that more instances of apoplexies occurred in the city of Philadelphia, in the winter of 1774-5, than had been

known in former years. I should have hesitated in recording this fact, had I not found the observation supported by a fact of the same kind, and produced by a nearly similar cause, in the appendix to the practical works of Doctor Baglivi, professor of physic and anatomy at Rome. After a very wet season in the winter of 1694-5, he informs us, that "apoplexies displayed their rage; and "perhaps (adds our author) that some part of this "epidemic illness was owing to the universal grief "and domestic care, occasioned by all Europe be-"ing engaged in a war. All commerce was dis-"turbed, and all the avenues of peace blocked up, "so that the strongest heart could scarcely bear "the thoughts of it." The winter of 1774-5 was a period of uncommon anxiety among the citizens of America. Every countenance wore the marks of painful solicitude, for the event of a petition to the throne of Britain, which was to determine whether reconciliation, or a civil war, with all its terrible and distressing consequences, were to take place. The apoplectic fit, which deprived the world of the talents and virtues of Peyton Randolph, while he filled the chair of congress, in 1775, appeared to be occasioned in part by the pressure of the uncertainty of those great events upon his mind. To the name of this illustrious patriot, several others might be added, who were affected

by the apoplexy in the same memorable year. At this time a difference of opinion upon the subject of the contest with Great-Britain, had scarcely taken place among the citizens of America.

II. The political events of the revolution produced different effects upon the human body, through the medium of the mind, according as they acted upon the friends or enemies of the revolution.

I shall first describe its effects upon the former class of citizens of the United States.

Many persons, of infirm and delicate habits, were restored to perfect health, by the change of place, or occupation, to which the war exposed them. This was the case in a more especial manner with hysterical women, who were much interested in the successful issue of the contest. The same effects of a civil war upon the hysteria, were observed by Doctor Cullen in Scotland, in the years 1745 and 1746. It may perhaps help to extend our ideas of the influence of the passions upon diseases, to add, that when either love, jealousy, grief, or even devotion, wholly engross the female mind, they seldom fail, in like manner, to cure or to suspend hysterical complaints.

An uncommon cheerfulness prevailed every where, among the friends of the revolution. Defeats, and even the loss of relations and property, were soon forgotten in the great objects of the war.

The population in the United States was more rapid from births during the war, than it had ever been in the same number of years since the settlement of the country.

I am disposed to ascribe this increase of births *chiefly* to the quantity and extensive circulation of money, and to the facility of procuring the means of subsistence during the war, which favoured marriages among the labouring part of the people*. But I have sufficient documents to prove, that marriages were more fruitful than in former years, and that a considerable number of unfruitful marriages became fruitful during the war. In 1783, the year of the peace, there were several

* Wheat, which was sold before the war for seven shillings and sixpence, was sold for several years *during* the war for four, and in some places for two and sixpence Pennsylvania currency per bushel. Beggars of every description disappeared in the year 1776, and were seldom seen till near the close of the war.

children born of parents who had lived many years together without issue.

Mr. Hume informs us, in his History of England, that some old people, upon hearing the news of the restoration of Charles II, died suddenly of joy. There was a time when I doubted the truth of this assertion; but I am now disposed to believe it, from having heard of a similar effect from an agreeable political event, in the course of the American revolution. The door-keeper of congress, an aged man, died suddenly, immediately after hearing of the capture of Lord Cornwallis' army. His death was universally ascribed to a violent emotion of political joy. This species of joy appears to be one of the strongest emotions that can agitate the human mind.

Perhaps the influence of that ardour in trade and speculation, which seized many of the friends of the revolution, and which was excited by the fallacious nominal amount of the paper money, should rather be considered as a disease, than as a passion. It unhinged the judgment, deposed the moral faculty, and filled the imagination, in many people, with airy and impracticable schemes of wealth and grandeur. Desultory manners, and a peculiar species of extempore conduct, were among

its characteristic symptoms. It produced insensibility to cold, hunger, and danger. The trading towns, and in some instances the extremities of the United States, were frequently visited in a few hours or days by persons affected by this disease; and hence "to travel with the speed of a specu-"lator," became a common saying in many parts of the country. This species of insanity (if I may be allowed to call it by that name) did not require the confinement of a bedlam to cure it, like the South-Sea madness described by Doctor Mead. Its remedies were the depreciation of the paper money, and the events of the peace.

The political events of the revolution produced upon its enemies very different effects from those which have been mentioned.

The hypochondriasis of Doctor Cullen occurred, in many instances, in persons of this description. In some of them, the terror and distress of the revolution brought on a true melancholia*. The causes which produced these diseases may be reduced to four heads. 1. The loss of former power or influence in government. 2. The destruction of the hierarchy of the English church in

* Insania partialis sine dyspepsia, of Doctor Cullen.

America. 3. The change in the habits of diet, and company, and manners, produced by the annihilation of just debts by means of depreciated paper money. And 4. The neglect, insults, and oppression, to which the loyalists were exposed, from individuals, and, in several instances, from the laws of some of the states.

It was observed in South-Carolina, that several gentlemen who had protected their estates by swearing allegiance to the British government, died soon after the evacuation of Charleston by the British army. Their deaths were ascribed to the neglect with which they were treated by their ancient friends, who had adhered to the government of the United States. The disease was called, by the common people, the *protection fever*.

From the causes which produced this hypochondriasis, I have taken the liberty of distinguishing it by the name of *revolutiana*.

In some cases, this disease was rendered fatal by exile and confinement; and, in others, by those persons who were afflicted with it, seeking relief from spiritous liquors.

The termination of the war by the peace in 1783, did not terminate the American revolution. The minds of the citizens of the United States were wholly unprepared for their new situation. The excess of the passion for liberty, inflamed by the successful issue of the war, produced, in many people, opinions and conduct which could not be removed by reason nor restrained by government. For a while, they threatened to render abortive the goodness of heaven to the United States, in delivering them from the evils of slavery and war. The extensive influence which these opinions had upon the understandings, passions, and morals of many of the citizens of the United States, constituted a form of insanity, which I shall take the liberty of distinguishing by the name of *anarchia*.

I hope no offence will be given by the freedom of any of these remarks. An inquirer after philosophical truth should consider the passions of men in the same light that he does the laws of matter or motion. The friends and enemies of the American revolution must have been more, or less than men, if they could have sustained the magnitude and rapidity of the events that characterised it, without discovering some marks of human weakness, both in body and mind. Perhaps these weaknesses were permitted, that human nature might

receive fresh honours in America, by the contending parties (whether produced by the controversies about independence or the national government) mutually forgiving each other, and uniting in plans of general order, and happiness.

AN INQUIRY

INTO

THE RELATION OF

TASTES AND ALIMENTS

TO EACH OTHER,

AND

INTO THE INFLUENCE OF THIS RELATION

UPON

HEALTH AND PLEASURE.

AN INQUIRY, &c.

IN entering upon this subject, I feel like the clown, who, after several unsuccessful attempts to play upon a violin, threw it hastily from him, exclaiming at the same time, that "there was music in it," but that he could not bring it out.

I shall endeavour, by a few brief remarks, to lay a foundation for more successful inquiries upon this difficult subject.

Attraction and repulsion seem to be the active principles of the universe. They pervade not only the greatest, but the minutest works of nature. Salts, earths, inflammable bodies, metals, and vegetables, have all their respective relations to each other. The order of these relations is so uniform, that it has been ascribed by some philosophers to

a latent principle of intelligence pervading each of them.

Colours, odours, and sounds, have likewise their respective relations to each other. They become agreeable and disagreeable, only in proportion to the natural or unnatural combination which takes place between each of their different species.

It is remarkable, that the number of original colours and notes in music is exactly the same. All the variety in both, proceeds from the difference of combination. An arbitrary combination of them is by no means productive of pleasure. The relation which every colour and sound bear to each other, was as immutably established at the creation, as the order of the heavenly bodies, or as the relation of the objects of chemistry to each other.

But this relation is not confined to colours and sounds alone. It probably extends to the objects of human aliment. For example, bread and meat, meat and salt, the alkalescent meats and acescent vegetables, all harmonize with each other upon the tongue; while fish and flesh, butter and raw onions, fish and milk, when combined, are all offensive to a pure and healthy taste.

It would be agreeable to trace the analogy of sounds and tastes. They have both their flats and their sharps. They are both improved by the contrast of discords. Thus pepper, and other condiments (which are disagreeable when taken by themselves) enhance the relish of many of our aliments, and they are both delightful in proportion as they are simple in their composition. To illustrate this analogy by more examples from music, would lead us from the subject of the present inquiry.

It is observable that the tongue and the stomach, like instinct and reason, are, by nature, in unison with each other. One of those organs must always be disordered, when they disagree in a single article of aliment. When they both unite in articles of diet that were originally disagreeable, it is owing to a perversion in each of them, similar to that which takes place in the human mind, when both the moral faculty and the conscience lose their natural sensibility to virtue and vice.

Unfortunately for this part of science, the taste and the stomach are so much perverted in infancy and childhood by heterogeneous aliment, that it is difficult to tell what kinds, and mixtures of food are natural, and what are artificial. It is true, the system possesses a power of accommodating itself

both to artificial food, and to the most discordant mixtures of that which is natural; but may we not reasonably suppose, that the system would preserve its natural strength and order much longer, if no such violence had been offered to it?

If the relation of aliments to each other follows the analogy of the objects of chemistry, then their union will be influenced by many external circumstances, such as heat and cold, dilution, concentration, rest, motion, and the addition of substances which promote unnatural, or destroy natural mixtures. This idea enlarges the field of inquiry before us, and leads us still further from facts and certainty upon this subject, but at the same time it does not preclude us from the hope of obtaining both; for every difficulty that arises out of this view of the subject, may be removed by observation and experiment.

I come now to apply these remarks to health and pleasure. I shall select only a few cases for this purpose; for if my principles be true, my readers cannot avoid discovering many other illustrations of them.

1. When an article of diet is grateful to the taste, and afterwards disagrees with the stomach,

may it not be occasioned by some other kind of food, or by some drink being taken into the stomach, which refuses to unite with the offending article of diet?

2. May not the uneasiness which many persons feel after a moderate meal, arise from its having consisted of articles of aliment which were not related to each other?

3. May not the delicacy of stomach which sometimes occurs after the fortieth or forty-fifth year of human life, be occasioned by nature recovering her empire in the stomach, so as to require simplicity in diet, or such articles only of aliment as are related? May not this be the reason why most people, who have passed those periods of life, are unable to retain or to digest fish and flesh at the same time, and why they generally dine only upon one kind of food?

4. Is not the language of nature in favour of simplicity in diet, discovered by the avidity with which the luxurious and intemperate often seek relief from variety and satiety, by retreating to spring water for drink, and to bread and milk for aliment?

5. May not the reason why plentiful meals of fish, venison, oysters, beef, or mutton, when eaten alone, lie so easily in the stomach, and digest so speedily, be occasioned by no other food being taken with them? A pound, and even more, of the above articles, frequently oppress the system much less than half the quantity of heterogeneous aliments.

6. Does not the facility with which a due mixture of vegetable and animal food digests in the stomach, indicate the certainty of their relation to each other?

7. May not the peculiar good effects of a diet wholly vegetable, or animal, be occasioned by the more frequent and intimate relation of the articles of the same kingdoms to each other? And may not this be the reason why so few inconveniences are felt from the mixture of a variety of vegetables in the stomach?

8. May not the numerous acute and chronic diseases of the rich and luxurious, arise from heterogeneous aliments being distributed in a *diffused*, instead of a *mixed* state, through every part of the body?

9. May not the many cures which are ascribed to certain articles of diet, be occasioned more by their being taken alone, than to any medicinal quality inherent in them? A diet of oysters in one instance, of strawberries in another, and of sugar of roses in many instances, has cured violent and dangerous diseases of the breast*. Grapes, according to Doctor Moore, when eaten in large quantities, have produced the same salutary effect. A milk diet, persisted in for several years, has cured the gout and epilepsy. I have seen many cases of dyspepsia cured by a simple diet of beef and mutton, and have heard of a well-attested case of a diet of veal alone having removed the same disease. Squashes, and turnips likewise, when taken by themselves, have cured that distressing complaint in the stomach. It has been removed even by milk, when taken by itself in a moderate quantity†. The further the body, and more especially the stomach, recede from health, the more this simplicity of diet becomes necessary. The appetite in these cases does not speak the language of uncorrupted nature. It frequently calls for va-

* Vansweiten, 1209. 3.

† Medical Observations and Inquiries, vol. VI. p. 310, 319.

rious and improper aliment; but this is the effect of intemperance having produced an early breach between the taste and the stomach.

Perhaps the extraordinary cures of obstinate diseases which are sometimes performed by persons not regularly educated in physic, may be occasioned by a long and steady perseverance in the use of a single article of the materia medica. Those chemical medicines which decompose each other, are not the only substances which defeat the intention of the prescriber. Galenical medicines, by combination, I believe, frequently produce effects that are of a compound and contrary nature to their original and simple qualities. This remark is capable of extensive application, but I quit it as a digression from the subject of this inquiry.

10. I wish it to be observed, that I have condemned the mixture of different aliments in the stomach only in a few cases, and under certain circumstances. It remains yet to determine by experiments, what changes are produced upon aliments by heat, dilution, addition, concentration, motion, rest, and the addition of uniting substances, before we can decide upon the relation of aliments to each other, and the influence of that relation upon health. The olla podrida of Spain is said

to be a pleasant and wholesome dish. It is probably rendered so, by a previous tendency of all its ingredients to putrefaction, or by means of heat producing a new arrangement, or additional new relations of all its parts. I suspect heat to be a powerful agent in disposing heterogeneous aliments to unite with each other; and hence the mixture of aliments is probably less unhealthy in France and Spain, than in England, where so much less fire is used in preparing them, than in the former countries.

As too great a mixture of glaring colours, which are related to each other, becomes painful to the eye, so too great a mixture of related aliments oppresses the stomach, and debilitates the powers of the system. The original colours of the sky, and of the surface of the globe, have ever been found the most permanently agreeable to the eye. In like manner, I am disposed to believe that there are certain simple aliments which correspond, in their sensible qualities, with the intermediate colours of *blue* and *green*, that are most permanently agreeable to the tongue and stomach, and that every deviation from them, is a departure from the simplicity of health and nature.

11. While nature seems to have limited us to simplicity in aliment, is not this restriction abundantly compensated by the variety of tastes which she allows us to impart to it, in order to diversify and increase the pleasure of eating? It is remarkable that salt, sugar, mustard, horse-radish, capers, and spices of all kinds, according to Mr. Gosse's experiments, related by Abbè Spallanzani*, all contribute not only to render aliments savoury, but to promote their digestion.

12. When we consider, that part of the art of cookery consists in rendering the taste of aliments agreeable, is it not probable that the pleasure of eating might be increased beyond our present knowledge upon that subject, by certain new arrangements or mixtures of the substances which are used to impart a pleasant taste to our aliment?

13. Should philosophers ever stoop to this subject, may they not discover and ascertain a table of the relations of sapid bodies to each other, with the same accuracy that they have ascertained the relation of the numerous objects of chemistry to each other?

* Dissertations, vol. I. p. 326.

14. When the tongue and stomach agree in the same kinds of aliment, may not the increase of the pleasure of eating be accompanied with an increase of health and prolongation of life?

15. Upon the pleasure of eating, I shall add the following remarks. In order to render it truly exquisite, it is necessary that all the senses, except that of taste, should be as *quiescent* as possible. Those persons mistake the nature of the appetite for food, who attempt to whet it by accompanying a dinner by a band of music, or by connecting the dining table, with an extensive and delightful prospect. The undue excitement of one sense, always produces weakness in another. Even conversation sometimes detracts from the pleasure of eating: hence great feeders love to eat in silence, or alone; and hence the speech of a passionate Frenchman, while dining in a talkative company, was not so improper as might be at first imagined. "Hold your tongues (said he); I cannot taste my dinner." I know a physician, who, upon the same principle, always shuts his eyes, and requests silence in a sick chamber, when he wishes to determine by the pulse the propriety of blood-letting, in cases where its indication is doubtful. His perceptions become more distinct, by confining his whole attention to the sense of feeling.

It is impossible to mention the circumstance of the senses acting only in succession to each other in the enjoyment of pleasure, without being struck with the impartial goodness of Heaven, in placing the rich and the poor so much upon a level in the pleasures of the table. Could the numerous objects of pleasure, which are addressed to the ears and the eyes, have been possessed at the same time with the pleasure of eating, the rich would have commanded three times as much pleasure in that enjoyment as the poor; but this is so far from being the case, that a king has no advantage over a beggar, in eating the same kind of aliment.

THE

NEW METHOD OF INOCULATING

FOR THE

SMALL-POX.

DELIVERED IN A LECTURE IN THE UNIVERSITY OF PENNSYLVANIA, ON THE 20TH OF FEBRUARY, 1781.

THE NEW METHOD, &c.

GENTLEMEN,

IT must afford no small pleasure to a benevolent mind, in the midst of a war which daily makes so much havoc with the human species, to reflect that the small-pox, which once proved equally fatal to thousands, has been checked in its career, and in a great degree subdued, by the practice of INOCULATION.

It is foreign to my purpose to deliver to you the history of this art, and to mark the various steps that have attended its progress to its present state of improvement. We have yet to lament the want of uniformity and of equal success in the practice of it among physicians. A great number of pamphlets have been written upon the subject without exhausting it. There is still am-

ple room left for the man of genius to exercise his talents for observation and reasoning upon it. The facts I mean to lay before you are so inconsiderable, compared with what still remain to be known upon this subject, that I have to request, when your knowledge in it is completed, that you would bury my name in silence, and forget that ever I ventured to lay a single stone in this part of the fabric of science.

In treating upon this subject, I shall

I. Consider the proper subjects, and seasons for inoculation.

II. I shall describe the method of communicating the disease.

III. I shall consider the method of preparing the body for the small-pox.

IV. I shall mention the treatment proper during the eruptive fever. And,

V. Point out a few cautions that are necessary after the disease is over.

I. Formerly there were great difficulties in the choice of subjects for inoculation. But experience teaches us, that it may be practised in every stage of life, and in almost every condition of the human body. In infancy, the periods before and after dentition are to be preferred. But we seldom see any great inconveniences from submitting to the general necessity of inoculating children between the ages of three months, and two years. Indeed we often see children cut three or four teeth during the preparation and eruptive fever, without the least addition being made to any of the troublesome symptoms which accompany the small-pox. There is one inconvenience attending the choice of the first months of infancy for inoculating, and that is, the matter often fails of producing the disease in such young subjects. I have frequently failed in two or three attempts to communicate it to children under four months old, with the same matter that has succeeded in a dozen other patients, inoculated at the same time. When the inoculation succeeds in such tender subjects, they generally have less fever, and fewer pustules, than are common in any future period of life.

Although a physician would prefer a patient in good health to any other as a subject for inoculation, yet cases often occur in which it is necessary

to communicate the small-pox while the body is affected with some other disease. I can with pleasure inform you, that the small-pox is rendered so perfectly safe by inoculation, that there are few chronic diseases which should be considered as obstacles in the way of it. I have inoculated patients labouring under a tertian fever, obstructed viscera, the hooping cough, the hypochondriasis, the asthma, the itch, and other cutaneous diseases, and even pregnant women, with the same, and, in some instances, with greater success, than persons in perfect health. Doctor Cullen informs us, that he has seen inoculation succeed in scrophulous patients. A physician in Jamaica informed me, that he had inoculated negroes with success in the worst stage of the yaws. To these facts I must add one more extraordinary than any that has been yet mentioned: Doctor Brown, my late colleague in the care of the military hospitals, informed me, that he had seen inoculation succeed in patients who were seized, after the infection was communicated, with the hospital fever. The preparation of the body should be accommodated to the disease which affects it. Some physicians have thought the small-pox, received in this way, was a remedy for other diseases; but my experience has not confirmed this opinion: on the contrary, I am inclined to think that no other change is produced by

inoculation, than by the regimen and medicines that are used to prepare the body for the small-pox. Nor does the small-pox, during its continuance, afford any security against the attacks of other diseases. I have seen the most alarming complication of the small-pox and measles taken in *succession* to each other, in the same person.

The seasons commonly preferred for inoculation, in this country, are the spring and fall. It may be practised with equal safety in the winter, a due regard being had to the temperature of the air in the preparation of the body.

The principal objection to inoculating in the summer months in this climate, arises from the frequency of bilious diseases at that season, to which the preparation necessary for the small-pox probably disposes the body. This caution applies more directly to children, who, at a certain age, are more subject than grown people to a disease in their bowels in warm weather.

II. The methods of communicating the small-pox by inoculation, have been different in different countries, and in the different æras of its progress towards its present stage of improvement. The scab, dossel of lint, and the thread impregnated

with variolous matter, and bound up in a gash in the arm, have been laid aside.

We are indebted to Mr. Sutton for the mode of communicating it by a slight puncture with the point of a lancet, or needle, dipt in fresh matter. As it is difficult sometimes to procure matter in a fresh state, I have been led to use it with equal success by preserving it on lint in a box, and moistening it with cold water just before I used it. Matter may be kept in this way for a month, without losing its infectious quality, provided it be not exposed to heat or moisture. The former destroys its power of infecting as certainly as the salt of tartar destroys the acidity of vinegar. Moisture, by remaining long upon the matter, probably destroys its virulence, by subjecting it to fermentation. The longer matter has been kept in a general way, the longer the distance will be between the time of communicating the disease, and the eruptive fever. It will be proper always to yield to the prejudices of our patients in favour of matter taken from persons who have but few pustules. But I am persuaded from repeated observations, that the disease is no ways influenced by this circumstance. I am satisfied likewise that there is no difference between the effects of the matter, whether it be taken in its watery and purulent

state. The puncture should not be larger than is sufficient to draw one drop of blood, but it should always be made by a *sharp* lancet, for the sudden inflammation and suppuration, excited by a dull lancet, sometimes throw off the matter, so as to prevent its infecting the body*. No plaster or bandage should be applied over the puncture. It should be made in the left arm of all subjects. The objections to inoculating in the leg are too obvious to be mentioned. I have heard of the disease being communicated by rubbing the dry skin with the matter. My own observations upon this subject, give me reason to suspect the facts that are contained in books relative to this mode of infecting the body. I have bound large pieces of lint dipt in fresh matter for twenty-four hours upon the arm, without producing the disease. A practitioner of physic in New-Jersey informed me, that he once gave a considerable quantity of fresh variolous matter in a dose of physic, without infecting his patient. I suspect the matter that produces the disease is of the same

* I am disposed to believe that the external applications which are used by the Indians for the cure of the bite of poisonous snakes act only by exciting inflammation and suppuration, which discharge the poison from the wound before it is absorbed. All their external remedies are of a *stimulating* nature.

nature with certain poisons, which require to be brought in contact with a wound or sore in the body, before they produce their effects. I deliver this opinion with diffidence. The subject stands in need of more experiments and investigation.

III. I come now to consider the best method of preparing the body for the small-pox. This must be done, 1st, by DIET, and 2dly, by MEDICINE. The DIET should consist chiefly of vegetables. I have never seen any inconvenience from the free use of milk, as a part of the preparative diet. In some habits, where a morbid acid prevails in the stomach, we may indulge our patients in a little weak flesh broth two or three times a week with safety. A little salted meat may likewise be taken daily in such cases. Tea, coffee, and even weak chocolate, with biscuit or dry toast, may be used as usual, by persons accustomed to that kind of aliment. Wine and spirits of all kinds should be withheld from our patients, during the preparation. The more acescent their drinks are, the better. It is unnecessary that this change in the diet should take place till a day or two before the time of communicating the disease. The system accommodates to a vegetable and low diet in the course of three weeks or a month, so as to defeat in some measure the advantages we expected

from it. The good effects of it appear to depend in a great degree upon the *suddenness* with which we oblige our patients to conform to it. For this reason, when we are called upon to inoculate persons who have lived more than three or four weeks upon a low diet, we should always direct them to live a few days upon animal food, before we communicate the disease to them. By these means we may produce all the good effects of the *sudden* change in the diet I have already mentioned. 2. The MEDICINES most commonly used to prepare the body for the small-pox are antimony and mercury. The latter has had the preference, and has been given in large quantities, under a notion of its being a specific antidote to the variolous matter. Many objections might be made to this opinion; I shall mention only three.

1. We often see the disease in a high degree, after the system is fully impregnated with mercury.

2. We often see the same salutary effects of mercury, when given before the disease is communicated to the body, that we perceive when it is given after inoculation; in which case we are sure the mercury cannot enter into the mixture with the variolous matter so as to destroy it.

3. If mercury acted specifically in destroying the variolous matter, it would render every other part of the preparation unnecessary: but this we know is not the case, for the neglect or improper use of the vegetable diet or cool regimen is often attended with an extraordinary number, or virulence of the small-pox, even in those cases where mercury is given in the largest quantity.

The way in which mercury prepares the body for the small-pox, seems to be by promoting the several excretions, particularly that by perspiration, which, by diminishing the quantity of the fluids, and weakening the tone of the solids, renders the system less liable to a plentiful eruption of the small-pox. But I object to the use of this medicine for the following reasons:

1. It effectually deprives us of all the benefits of the cool regimen; for mercury, we know, always *disposes* the system to take cold.

2. All the good effects of mercury may be produced by PURGES, which do not subject the body to the above-mentioned inconvenience.

The PURGES may be suited to the constitutions, and in some cases, even to the inclinations of our

patients. I have seen jalap, rhubarb, senna, manna, aloes, soluble tartar, glauber and Epsom salts, and the butternut pill, all given with equal success. The quantity should be sufficient to procure three or four stools every day. A little magnesia should always be mixed with rhubarb and jalap in preparing children. It will be sufficient for the mothers and nurses of infants to conform strictly to the vegetable diet. I have never seen any advantages from giving them even a single dose of physic.

It is hardly necessary to observe, that the quality, dose, and number of purges are to be determined by the age, sex, and habits of our patients. A constitution enfeebled by a previous disease forbids the use of purges, and requires medicines of a restorative kind. Patients afflicted with cutaneous diseases bear larger and more frequent doses of physic, than are indicated in more healthy subjects.

In adult subjects of a plethoric habit, bloodletting is very useful on the third or fourth day after inoculation. We are not to suppose, that every fat person labours under a plethora. A moderate degree of fat is so far from rendering the disease more violent, especially in children, that I

think I have generally found such subjects have the small-pox more favourably than others.

Moderate exercise in the open air should be used during the preparation. But hard labour, and every thing that promotes sweat or fatigue, as also the extremes of heat and cold, should be avoided.

IV. We come now to consider the treatment of the body during the eruptive fever. On the eighth day after inoculation our patients are *generally* seized with the common symptoms of fever. Sometimes this fever appears on the sixth and seventh day after inoculation. But when it is irregular, it is often delayed till the ninth and tenth days. I have seen many instances of it on the fourteenth, a few on the fifteenth and sixteenth, and *one* case in which it did not come on till the eighteenth day after the infection was communicated to the body*. The place where the puncture was made

* Since the publication of the first edition of this lecture, I have heard of two cases, in one of which the fever did not come on till the twentieth, and in the other till the twenty-first day after the infection was communicated to the body. In some of these tedious cases, I have seen an inflammation and suppuration on the punctured part of the arm on the eighth day without any fever. Perhaps in these cases

with the lancet, or needle, generally serves as a harbinger of the approaching fever. A slight inflammation appears about it, and a pock rises up in the centre. But this remark is liable to some objections. I have seen *four* instances in which the fever came on at the expected time, and the disease went through all its stages with the greatest regularity, and yet there was no sign of an inflammation or pock near the spot where the puncture was made: even the puncture itself became invisible. On the other hand, we sometimes see an inflammation and pock on the arm appear on the eighth and ninth days, without any fever accompanying them. Some physicians suppose that this inflammation and solitary pock are sufficient to constitute the disease; but repeated experience has taught me to be very cautious in relying upon these equivocal marks. It is true, I have sometimes seen patients secured against the small-pox, both in the natural way and by inoculation, where these marks have appeared; but I have as often seen such patients seized afterwards with the small-pox in the natural way, to the great distress of families, and mortification of physicians. Upon this account, I make it a constant

the inflammation and suppuration are only cuticular, and that the small-pox is taken from the matter which is formed by them.

practice to advise a second or third inoculation, where a fever and eruption have been wanting. As the absence of these symptoms is probably occasioned by the weakness or age of the variolous matter, or the too high state of preparation of the body, we should always guard against both, by making the puncture the second time with *fresh* matter, by subjecting our patients to a *less* abstemious diet, and by giving fewer doses of physic. I have heard it remarked, that if a slight redness and a small pimple appeared on the arm on the third day after inoculation, it was a sign the matter had infected the whole constitution. I acknowledge I have often seen a greater degree of redness on the third than on the second day after inoculation, but I have not been able to establish a diagnostic mark from it; for I have seen the disease produced on the usual days where the redness has appeared on the second day, and in some cases where it has not appeared until the eruptive fever.

I am led here unwillingly to discuss the old question, Is it possible to have the small-pox in the natural way after inoculation?—In many of the cases supposed to be the small-pox from inoculation, it is probable the matter has been taken from the chicken-pox, which resembles the small-pox in many of its peculiarities, but in none more than that

of leaving pits or marks on the skin. But there are certainly cases where there are the most irrefragable proofs of the infection implanted by inoculation being of a variolous nature, where the disease has been afterwards taken in the natural way. In these cases I would suppose the variolous matter produced only a topical or cuticular disease. We see something analogous to this in nurses who attend patients in the small-pox. But further, this topical or cuticular infection may be produced by art in persons who have had the small-pox in the natural way. Some years ago, I made a puncture on my left hand with a lancet moistened with variolous matter. On the eighth day an inflammation appeared on the place, accompanied by an efflorescence in the neighbourhood of it, which extended about two inches in every direction from the spot where the puncture was made. On the eleventh day I was surprised to find two pocks (if I may venture to call them such), the one on the outside of the fourth finger of my left hand, and the other on my forehead. They remained there for several days, but without filling with matter, and then dropped off, rather in the form of a soft wart, than of a common scab. Doctor Way of Wilmington repeated the same experiment upon himself, but with an issue to his curiosity more extraordinary than that I have just now related. On

the eighth day after he had made a puncture on his hand, a pock appeared on the spot, which in the usual time filled with matter, from which he inoculated several children, who sickened at the usual time, and went through all the common stages and symptoms of the small-pox. It would seem from these facts, that it is necessary the small-pox should produce some impression upon the *whole* system, in order to render it ever afterwards incapable of receiving an impression of a similar nature. A fever and an eruption therefore seem necessary for this purpose. As the inflammation of the arm on the eighth day is a sign of the *topical* and cuticular infection, so an eruption (though ever so small) seems to to be the only certain sign of the infection of the *whole* system. The eruption is the more decisive in its report, in proportion as it comes out and goes off in the usual manner of the small-pox in the natural way. In those cases where patients have been secured against a second attack of the disease, when there have been no *obvious* fever or *visible* eruption, I think I have observed an unusual inflammation, and a copious and long continued discharge of matter from the arm. Perhaps this may serve as an outlet of the matter, which in other cases produces the fever and eruption. I am the more disposed to embrace this opinion, from the testimony which several authors

have left us of the effects of ulcers in securing the body from the infection of the plague. The effects of issues are still more to our purpose. We observe a plentiful discharge of matter from them every time the body is exposed to cold, and the febrile effects of it upon the system are thereby frequently obviated. How far a ratio exists between the degrees of inflammation and the discharge of matter from the arm, and the degrees of fever and eruption, must be determined by future and very accurate observations. If it should appear, that there are the least inflammation and smallest discharge, where there have been the highest fever and most copious eruption; and, on the contrary, if it should appear that there are the greatest inflammation and discharge, where there have been the least fever and smallest eruption, I must beg leave to add, without attempting in this place to explain the reasons of it, that the remark, if generally true, is liable to some exceptions. But the subject is involved in darkness; I shall be satisfied if I have brought you within sight of the promised land. Your own ingenuity, like another Jewish leader, must conduct you thither.

The indications in the treatment of the body during the eruptive fever are,

I. To regulate the degree of fever.

II. To mitigate troublesome and alarming symptoms.

The fever which produces the eruption is generally of the inflammatory kind. It sometimes, therefore, comes on with the symptoms of great heat, preceded with chilliness, and determination to the head and breast, and a full hard pulse. The remedies proper in this case are,

1. Blood-letting. The quantity to be drawn must be regulated by the violence of the symptoms, the constitution, habits, and even country of the patient, and by the season of the year. I have never found more than one bleeding, to the quantity of twelve or fourteen ounces, necessary in any stage or degree of the eruptive fever of the small-pox by inoculation.

2. Cool air is of the utmost consequence in the eruptive fever. The use of this remedy in fevers marks an æra, not only in the management of the small-pox, but in medicine. The degrees of cold should always be increased in proportion to the violence of the fever. Stove-rooms, so common in this country, should be carefully avoided. The more we oblige our patients to sit up and walk in the open air, the better. Even in those cases where

they languish most for the bed, they should be encouraged rather to lie upon, than *under* the bed-clothes. Children should be stript of flannel petticoats that come in contact with their skins; and even clouts should be laid aside, if possible without great inconvenience, and at any rate they should be often removed. Great and obvious as the advantages of cold air appear to be in the eruptive fever, it has sometimes been used to an excess that has done mischief. There are few cases where a degree of cold below fifty of *Fahrenheit's* thermometer is necessary in this stage of the small-pox. When it has been used below this, or where patients have been exposed to a damp atmosphere some degrees above it, I have heard of inflammations of an alarming nature being produced in the throat and breast.

3. The bowels, more especially of children, should be kept open with gentle laxatives. And,

4. Cool subacid drinks should be plentifully used until the eruption be completed.

Sometimes the small-pox comes on with a fever the reverse of that which we have described. The heat is inconsiderable, the pulse is weak, and scarcely quicker than ordinary, and the patient

complains of but slight pains in the back and head. Here the treatment should be widely different from that which has been mentioned when the fever is of the inflammatory kind. Bleeding in this case is hurtful, and even cool air must be admitted with caution. The business of the physician in this case is to excite a gentle action in the sanguiferous system, in order to produce the degree of fever which is necessary to the eruption of the pock. For this purpose he may recommend the use of warm drinks, and even of a warm bed with advantage. If the eruption delay beyond the third day, with all the circumstances of debility that have been mentioned, I have frequently ordered my patients to eat a few ounces of animal food, and to drink a glass or two of wine, with the most desirable success. The effects of this indulgence are most obvious where the weakness of the fever and the delay of the eruption in children, have made it necessary to allow it to mothers and nurses.

The small-pox by inoculation so seldom comes on with the symptoms of what is called a malignant fever, that little need be said of the treatment proper in such cases. I shall only observe, that the cold regimen in the highest degree, promises more success in these cases than in any others. I have repeatedly been told, that when the small-pox ap-

pears confluent among the Africans, it is a common practice for mothers to rub their children all over with pepper, and plunge them immediately afterwards into a spring of cold water. This, they say, destroys a great part of the pock, and disposes the remainder to a kindly suppuration. From the success that has attended the use of the cold bath in malignant fevers in some parts of Europe*, I am disposed to believe in the efficacy of the African remedy.

The fever generally lasts three days, and the eruption continues for a similar length of time, counting the last day of the fever, as the first day of the eruption. But this remark is liable to many exceptions. We sometimes observe the eruption to begin on the first, and often on the second day of the fever; and we sometimes meet with cases in which a second eruption comes on after the fever has abated for several days, and the

* In a dissertation entitled "*Epidemia verna quæ Wratislaviam, Anno.* 1737 *afflixit,*" published in the appendix to the Acta Nat. Curios. Vol. X. it appears, that washing the body all over with cold water in putrid fevers, attended with great debility, was attended with success at *Breslaw* in *Silesia.* The practice has since been adopted, we are told, by several of the neighbouring countries. CULLEN'S FIRST LINES OF THE PRACTICE OF PHYSIC.

first eruption considerably advanced in its progress towards a complete suppuration. This is often occasioned by the application of excessive cold or heat to the body, or by a sudden and premature use of stimulating drinks, or animal food.

I come now to treat of the best method of mitigating troublesome and alarming symptoms.

The only *alarming* symptom is convulsions, to which children are subject during the time of dentition. These have been less frequent, since the liberal and judicious use of cool air in the eruptive fever than formerly. They are often relieved by putting the feet in warm water. But a more effectual and speedy method of curing them, is to expose our patients suddenly to the open air. The colder the air the quicker relief it affords in these cases. To prevent the return of the fits, as well as to allay any disagreeable and troublesome startings, a few drops of laudanum should be given. They generally yield in a little while to this excellent remedy.

The next symptom which demands the aid of our art, is the inflammation and sore on the arm. Poultices of all kinds should be laid aside, as tending to increase the inflammation and sore. Instead

of these, the part affected should be washed three or four times a day with cold water*. This application is not only agreeable to our patients, but soon checks the progress of the inflammation, and disposes the sore to heal about the time the eruption is completed. The eyes should likewise be washed frequently with cold water, to secure them from pustules and inflammation. With respect to those alarming or troublesome symptoms which occur in those cases where the pocks are numerous, or confluent, they happen so seldom in inoculation, that they do not come properly under our notice in this place. They are moreover fully discussed by Doctors Boerhaave, Huxham, Hillary, and other practical writers.

V. I come now, in the last place, to deliver a few directions that are necessary after the eruption and suppuration are over.

It is well known that eruptions of an obstinate nature sometimes follow the small-pox. These I believe are often occasioned by a too *sudden* and speedy use of animal food. To guard against these

* Where the inflammation on the arm has been so considerable as not to yield immediately to the application of cold water, I have used the vegeto-mineral water with advantage.

disagreeable consequences of inoculation, it is of the utmost importance to enjoin a cautious and *gradual* return to the free use of an animal diet; and at the same time it will be necessary to give our patients a dose or two of purging physic.

Thus, gentlemen, have I delivered to you a short history of the new method of inoculating for the small-pox. I am aware that prejudices are entertained against some parts of it by physicians of the most ancient name and character among us. I have witnessed the effects of the old and new methods of preparing the body upon many thousand patients, and I am satisfied, not only from my own observations, but from the experience of gentlemen upon whose judgments I rely more than upon my own, that the new method is by far the safest and most successful. Added to this, I can assure my pupils, that I have never known a single instance of a patient, prepared and treated in the manner I have described, that ever had an abscess after the small-pox, or even such an inflammation or sore upon the arm as required the application of a poultice.

AN INQUIRY

INTO THE

EFFECTS OF ARDENT SPIRITS

UPON THE

HUMAN BODY AND MIND.

WITH

AN ACCOUNT OF THE MEANS OF PREVENTING,

AND OF THE

REMEDIES FOR CURING THEM.

AN INQUIRY, &c.

PART I.

BY ardent spirits, I mean those liquors only which are obtained by distillation from fermented substances of any kind. To their effects upon the bodies and minds of men, the following inquiry shall be exclusively confined. Fermented liquors contain so little spirit, and that so intimately combined with other matters, that they can seldom be drunken in sufficient quantities to produce intoxication, and its subsequent effects, without exciting a disrelish to their taste, or pain, from their distending the stomach. They are moreover, when taken in a moderate quantity, generally innocent, and often have a friendly influence upon health and life.

The effects of ardent spirits divide themselves into such as are of a prompt, and such as are of a chronic nature. The former discover themselves in drunkenness, and the latter, in a numerous train of diseases and vices of the body and mind.

I. I shall begin by briefly describing their prompt, or immediate effects, in a fit of drunkenness.

This odious disease (for by that name it should be called) appears with more or less of the following symptoms, and most commonly in the order in which I shall enumerate them.

1. Unusual garrulity.

2. Unusual silence.

3. Captiousness, and a disposition to quarrel.

4. Uncommon good humour, and an insipid simpering, or laugh.

5. Profane swearing, and cursing.

6. A disclosure of their own, or other people's secrets.

7. A rude disposition to tell those persons in company, whom they know, their faults.

8. Certain immodest actions. I am sorry to say, this sign of the first stage of drunkenness, sometimes appears in women, who, when sober, are uniformly remarkable for chaste and decent manners.

9. A clipping of words.

10. Fighting; a black eye, or a swelled nose, often mark this grade of drunkenness.

11. Certain extravagant acts which indicate a temporary fit of madness. These are singing, hallooing, roaring, imitating the noises of brute animals, jumping, tearing off clothes, dancing naked, breaking glasses and china, and dashing other articles of household furniture upon the ground, or floor. After a while the paroxysm of drunkenness is completely formed. The face now becomes flushed; the eyes project, and are somewhat watery; winking is less frequent than is natural; the under lip is protruded; the head inclines a little to one shoulder; the jaw falls; belchings and hiccup take place; the limbs totter; the whole body staggers. The unfortunate subject of this history next falls on

his seat; he looks around him with a vacant countenance, and mutters inarticulate sounds to himself. He attempts to rise and walk; in this attempt, he falls upon his side, from which he gradually turns upon his back. He now closes his eyes, and falls into a profound sleep, frequently attended with snoring, and profuse sweats, and sometimes with such a relaxation of the muscles which confine the bladder and the lower bowels, as to produce a symptom which delicacy forbids me to mention. In this condition, he often lies from ten, twelve, and twenty-four hours, to two, three, four, and five days, an object of pity and disgust to his family and friends. His recovery from this fit of intoxication is marked with several peculiar appearances. He opens his eyes, and closes them again; he gapes and stretches his limbs; he then coughs and pukes; his voice is hoarse; he rises with difficulty, and staggers to a chair; his eyes resemble balls of fire; his hands tremble; he loathes the sight of food; he calls for a glass of spirits to compose his stomach; now and then he emits a deep-fetched sigh, or groan, from a transient twinge of conscience, but he more frequently scolds, and curses every thing around him. In this state of languor and stupidity he remains for two or three days, before he is able to resume his former habits of business and conversation.

Pythagoras we are told maintained that the souls of men after death, expiated the crimes committed by them in this world, by animating certain brute animals; and that the souls of those animals in their turns, entered into men, and carried with them all their peculiar qualities and vices. This doctrine of one of the wisest and best of the Greek philosophers, was probably intended only to convey a lively idea of the changes which are induced in the body and mind of man by a fit of drunkenness. In folly, it causes him to resemble a calf; in stupidity, an ass; in roaring, a mad bull; in quarrelling, and fighting, a dog; in cruelty, a tiger; in fetor, a skunk; in filthiness, a hog; and in obscenity, a he-goat.

It belongs to the history of drunkenness to remark, that its paroxysms occur, like the paroxysms of many diseases, at certain periods, and after longer or shorter intervals. They often begin with annual, and gradually increase in their frequency, until they appear in quarterly, monthly, weekly, and quotidian or daily periods. Finally they afford scarcely any marks of remission, either during the day or the night. There was a citizen of Philadelphia, many years ago, in whom drunkenness appeared in this protracted form. In speaking of him to one of his neighbours, I said,

"Does he not *sometimes* get drunk?" "You mean," said his neighbour, "is he not *sometimes* sober?"

It is further remarkable, that drunkenness resembles certain hereditary, family, and contagious diseases. I have once known it to descend from a father to four out of five of his children. I have seen three, and once four brothers who were born of sober ancestors, affected by it, and I have heard of its spreading through a whole family composed of members not originally related to each other. These facts are important, and should not be overlooked by parents, in deciding upon the matrimonial connections of their children.

Let us next attend to the chronic effects of ardent spirits upon the body and mind. In the body, they dispose to every form of acute disease; they moreover *excite* fevers in persons predisposed to them, from other causes. This has been remarked in all the yellow fevers which have visited the cities of the United States. Hard drinkers seldom escape, and rarely recover from them. The following diseases are the usual consequences of the habitual use of ardent spirits, viz.

1. A decay of appetite, sickness at stomach, and a puking of bile, or a discharge of a frothy and viscid phlegm by hawking, in the morning.

2. Obstructions of the liver. The fable of Prometheus, on whose liver a vulture was said to prey constantly, as a punishment for his stealing fire from heaven, was intended to illustrate the painful effects of ardent spirits upon that organ of the body.

3. Jaundice and dropsy of the belly and limbs, and finally of every cavity in the body. A swelling in the feet and legs is so characteristic a mark of habits of intemperance, that the merchants in Charleston, I have been told, cease to trust the planters of South-Carolina, as soon as they perceive it. They very naturally conclude industry and virtue to be extinct in that man, in whom that symptom of disease has been produced by the intemperate use of distilled spirits.

4. Hoarseness, and a husky cough, which often terminate in consumption, and sometimes in an acute and fatal disease of the lungs.

5. Diabetes, that is, a frequent and weakening discharge of pale, or sweetish urine.

6. Redness and eruptions on different parts of the body. They generally begin on the nose, and after gradually extending all over the face, sometimes descend to the limbs in the form of leprosy. They have been called "rum-buds," when they appear in the face. In persons who have occasionally survived these effects of ardent spirits on the skin, the face after a while becomes bloated, and its redness is succeeded by a death-like paleness. Thus the same fire which produces a red colour in iron, when urged to a more intense degree, produces what has been called a white heat.

7. A fetid breath, composed of every thing that is offensive in putrid animal matter.

8. Frequent and disgusting belchings. Dr. Haller relates the case of a notorious drunkard having been suddenly destroyed, in consequence of the vapour discharged from his stomach by belching, accidentally taking fire by coming in contact with the flame of a candle.

9. Epilepsy.

10. Gout, in all its various forms of swelled limbs, colic, palsy, and apoplexy.

Lastly, 11. Madness. The late Dr. Waters, while he acted as house pupil and apothecary of the Pennsylvania hospital, assured me, that in one-third of the patients confined by this terrible disease, it had been induced by ardent spirits.

Most of the diseases which have been enumerated are of a mortal nature. They are more certainly induced, and terminate more speedily in death, when spirits are taken in such quantities, and at such times, as to produce frequent intoxication: but it may serve to remove an error with which some intemperate people console themselves, to remark, that ardent spirits often bring on fatal diseases without producing drunkenness. I have known many persons destroyed by them, who were never completely intoxicated during the whole course of their lives. The solitary instances of longevity which are now and then met with in hard drinkers, no more disprove the deadly effects of ardent spirits, than the solitary instances of recoveries from apparent death by drowning, prove that there is no danger to life from a human body lying an hour or two under water.

The body after its death, from the use of distilled spirits, exhibits by dissection certain appearances which are of a peculiar nature. The fibres

of the stomach and bowels are contracted; abscesses, gangrene, and schirri are found in the viscera; the bronchial vessels are contracted; the blood-vessels and tendons, in many parts of the body, are more or less ossified; and even the hair of the head possesses a crispness which renders it less valuable to wig-makers than the hair of sober people.

Not less destructive are the effects of ardent spirits upon the human mind. They impair the memory, debilitate the understanding, and pervert the moral faculties. It was probably from observing these effects of intemperance in drinking, upon the mind, that a law was formerly passed in Spain, which excluded drunkards from being witnesses in a court of justice. But the demoralizing effects of distilled spirits do not stop here. They produce not only falsehood, but fraud, theft, uncleanliness, and murder. Like the demoniac mentioned in the New Testament, their name is "legion," for they convey into the soul, a host of vices and crimes.

A more affecting spectacle cannot be exhibited, than a person into whom this infernal spirit, generated by habits of intemperance, has entered. It is more or less affecting, according to the station

the person fills in a family, or in society, who is possessed by it. Is he a husband? How deep the anguish which rends the bosom of his wife! Is she a wife? Who can measure the shame and aversion which she excites in her husband! Is he the father, or is she the mother of a family of children? See their averted looks from their parent, and their blushing looks at each other! Is he a magistrate? or has he been chosen to fill a high and respectable station in the councils of his country? What humiliating fears of corruption in the administration of the laws, and of the subversion of public order and happiness, appear in the countenances of all who see him! Is he a minister of the gospel? Here language fails me. ——If angels weep,—it is at such a sight.

In pointing out the evils produced by ardent spirits, let us not pass by their effects upon the estates of the persons who are addicted to them. Are they inhabitants of cities? Behold their houses stripped gradually of their furniture, and pawned, or sold by a constable, to pay tavern debts! See their names upon record in the dockets of every court, and whole pages of newspapers filled with advertisements of their estates for public sale! Are they inhabitants of country places? Behold their houses with shattered windows! their barns with

leaky roofs! their gardens over-run with weeds! their fields with broken fences! their hogs without yokes! their sheep without wool! their cattle and horses without fat! and their children filthy, and half clad, without manners, principles, and morals! This picture of agricultural wretchedness is seldom of long duration. The farms and property thus neglected, and depreciated, are seized and sold for the benefit of a groupe of creditors. The children that were born with the prospect of inheriting them, are bound out to service in the neighbourhood; while their parents, the unworthy authors of their misfortunes, ramble into new and distant settlements, alternately fed on their way by the hand of charity, or a little casual labour.

Thus we see poverty and misery, crimes and infamy, diseases and death, are all the natural and usual consequences of the intemperate use of ardent spirits.

I have classed death among the consequences of hard drinking. But it is not death from the immediate hand of the Deity, nor from any of the instruments of it which were created by him. It is death from SUICIDE. Yes! thou poor degraded creature, who art daily lifting the poisoned bowl to thy lips, cease to avoid the unhallowed ground

in which the self-murderer is interred, and wonder no longer that the sun should shine, and the rain fall, and the grass look green upon his grave. Thou art perpetrating gradually, by the use of ardent spirits, what he has effected suddenly, by opium, or a halter. Considering how many circumstances, from a sudden gust of passion, or from derangement, may palliate his guilt, or that (unlike yours) it was not preceded and accompanied by any other crime, it is probable his condemnation will be less than yours at the day of judgment.

I shall now take notice of the occasions and circumstances which are supposed to render the use of ardent spirits necessary, and endeavour to show that the arguments in favour of their use in such cases are founded in error, and that, in each of them, ardent spirits, instead of affording strength to the body, increase the evils they are intended to relieve.

1. They are said to be necessary in very cold weather. This is far from being true; for the temporary warmth they produce, is always succeeded by a greater disposition in the body to be affected by cold. Warm dresses, a plentiful meal just before exposure to the cold, and eating occa-

sionally a little gingerbread, or any other cordial food, is a much more durable method of preserving the heat of the body in cold weather.

2. They are said to be necessary in very warm weather. Experience proves that they increase instead of lessening the effects of heat upon the body, and thereby dispose to diseases of all kinds. Even in the warm climate of the West-Indies, Dr. Bell asserts this to be true. "Rum (says this author) whether used habitually, moderately, or in excessive quantities, in the West-Indies, always diminishes the strength of the body, and renders men more susceptible of disease, and unfit for any service in which vigour or activity is required*." As well might we throw oil into a house, the roof of which was on fire, in order to prevent the flames from extending to its inside, as pour ardent spirits into the stomach, to lessen the effects of a hot sun upon the skin.

3. Nor do ardent spirits lessen the effects of hard labour upon the body. Look at the horse: with every muscle of his body swelled from morning till night in the plough, or a team, does he

* Inquiry into the causes which produce, and the means of preventing diseases among British officers, soldiers, and others in the West-Indies.

make signs for a draught of toddy or a glass of spirits, to enable him to cleave the ground, or to climb a hill? No; he requires nothing but cool water, and substantial food. There is no nourishment in ardent spirits. The strength they produce in labour is of a transient nature, and is always followed by a sense of weakness and fatigue.

But are there no conditions of the human body in which ardent spirits may be given? I answer, there are. 1st. When the body has been suddenly exhausted of its strength, and a disposition to faintness has been induced. Here a few spoonsful, or a wine-glassful of spirits, with or without water, may be administered with safety and advantage. In this case we comply strictly with the advice of Solomon, who restricts the use of "strong drink" only "to him who is ready to perish." 2dly. When the body has been exposed for a long time to wet weather, more especially if it be combined with cold. Here a moderate quantity of spirits is not only safe, but highly proper to obviate debility, and to prevent a fever. They will more certainly have those salutary effects, if the feet are at the same time bathed with them, or a half pint of them poured into the shoes or boots. These I believe are the only two cases in which distilled spirits are useful or necessary to persons in health.

AN INQUIRY, &c.

PART II.

BUT it may be said, if we reject spirits from being a part of our drinks, what liquors shall we substitute in their room? I answer, in the first place,

1. SIMPLE WATER. I have known many instances of persons who have followed the most laborious employments for many years in the open air, and in warm and cold weather, who never drank any thing but water, and enjoyed uninterrupted good health. Dr. Moseley, who resided many years in the West-Indies, confirms this remark. "I aver (says the doctor), from my own knowledge and custom, as well as the custom and observations of many other people,

that those who drink nothing but water, or make it their principal drink, are but little affected by the climate, and can undergo the greatest fatigue without inconvenience, and are never subject to troublesome or dangerous diseases."

Persons who are unable to relish this simple beverage of nature, may drink some one, or of all the following liquors, in preference to ardent spirits.

2. CYDER. This excellent liquor contains a small quantity of spirit, but so diluted, and blunted by being combined with a large quantity of saccharine matter, and water, as to be perfectly wholesome. It sometimes disagrees with persons subject to the rheumatism, but it may be made inoffensive to such people, by extinguishing a red hot iron in it, or by mixing it with water. It is to be lamented, that the late frosts in the spring so often deprive us of the fruit which affords this liquor. The effects of these frosts have been in some measure obviated by giving an orchard a north-west exposure, so as to check too early vegetation, and by kindling two or three large fires of brush or straw, to the windward of the orchard, the evening before we expect a night of frost. This last expedient has in many instances

preserved the fruit of an orchard, to the great joy and emolument of the ingenious husbandman.

3. MALT LIQUORS. The grain from which these liquors are obtained, is not liable, like the apple, to be affected by frost, and therefore they can be procured at all times, and at a moderate price. They contain a good deal of nourishment; hence we find many of the poor people in Great-Britain endure hard labour with no other food than a quart or three pints of beer, with a few pounds of bread in a day. As it will be difficult to prevent small beer from becoming sour in warm weather, an excellent substitute may be made for it by mixing bottled porter, ale, or strong beer with an equal quantity of water; or a pleasant beer may be made by adding to a bottle of porter, ten quarts of water, and a pound of brown sugar, or a pint of molasses. After they have been well mixed, pour the liquor into bottles, and place them, loosely corked, in a cool cellar. In two or three days, it will be fit for use. A spoonful of ginger added to the mixture, renders it more lively, and agreeable to the taste.

3. WINES. These fermented liquors are composed of the same ingredients as cyder, and are both cordial and nourishing. The peasants of

France, who drink them in large quantities, are a sober and healthy body of people. Unlike ardent spirits, which render the temper irritable, wines generally inspire cheerfulness and good humour. It is to be lamented that the grape has not as yet been sufficiently cultivated in our country, to afford wine to our citizens; but many excellent substitutes may be made for it, from the native fruits of all the states. If two barrels of cyder fresh from the press, are boiled into one, and afterwards fermented, and kept for two or three years in a dry cellar, it affords a liquor which, according to the quality of the apple from which the cyder is made, has the taste of Malaga, or Rhenish wine. It affords when mixed with water, a most agreeable drink in summer. I have taken the liberty of calling it POMONA WINE. There is another method of making a pleasant wine from the apple, by adding four and twenty gallons of new cyder to three gallons of syrup made from the expressed juice of sweet apples. When thoroughly fermented, and kept for a few years, it becomes fit for use. The blackberry of our fields, and the raspberry and currant of our gardens, afford likewise an agreeable and wholesome wine, when pressed and mixed with certain proportions of sugar and water, and a little spirit, to counteract their disposition to an ex-

cessive fermentation. It is no objection to these cheap and home-made wines, that they are unfit for use until they are two or three years old. The foreign wines in common use in our country, require not only a much longer time to bring them to perfection, but to prevent their being disagreeable, even to the taste.

4. MOLASSES and WATER, also VINEGAR and WATER, sweetened with sugar or molasses, form an agreeable drink in warm weather. It is pleasant and cooling, and tends to keep up those gentle and uniform sweats, on which health and life often depend. Vinegar and water constituted the only drink of the soldiers of the Roman republic, and it is well known they marched and fought in a warm climate, and beneath a load of arms which weighed sixty pounds. Boaz, a wealthy farmer in Palestine, we find treated his reapers with nothing but bread dipped in vinegar. To such persons as object to the taste of vinegar, sour milk, or buttermilk, or sweet milk diluted with water, may be given in its stead. I have known the labour of the longest and hottest days in summer supported, by means of these pleasant and wholesome drinks, with great firmness, and ended, with scarcely a complaint of fatigue.

5. The SUGAR MAPLE affords a thin juice, which has long been used by the farmers in Connecticut, as a cool and refreshing drink, in the time of harvest. The settlers in the western counties of the middle states will do well to let a few of the trees which yield this pleasant juice remain in all their fields. They may prove the means, not only of saving their children and grand-children many hundred pounds, but of saving their bodies from disease and death, and their souls from misery beyond the grave.

6. COFFEE possesses agreeable and exhilarating qualities, and might be used with great advantage to obviate the painful effects of heat, cold, and fatigue upon the body. I once knew a country physician, who made it a practice to drink a pint of strong coffee previously to his taking a long or cold ride. It was more cordial to him than spirits, in any of the forms in which they are commonly used.

The use of the cold bath in the morning, and of the warm bath in the evening, are happily calculated to strengthen the body in the former part of the day, and to restore it in the latter, from the languor and fatigue which are induced by heat and labour.

Let it not be said, ardent spirits have become necessary from habit in harvest, and in other seasons of uncommon and arduous labour. The habit is a bad one, and may be easily broken. Let but half a dozen farmers in a neighbourhood combine to allow higher wages to their labourers than are common, and a sufficient quantity of *any* of the pleasant and wholesome liquors I have recommended, and they may soon, by their example, abolish the practice of giving them spirits. In a little while they will be delighted with the good effects of their association. Their grain and hay will be gathered into their barns in less time, and in a better condition than formerly, and of course at a less expense, and a hundred disagreeable scenes from sickness, contention, and accidents will be avoided, all of which follow in a greater or less degree the use of ardent spirits.

Nearly all diseases have their predisposing causes. The same thing may be said of the intemperate use of distilled spirits. It will, therefore, be useful to point out the different employments, situations, and conditions of the body and mind, which predispose to the love of those liquors, and to accompany them with directions to prevent persons being ignorantly and undesignedly seduced into the habitual and destructive use of them.

1. Labourers bear with great difficulty, long intervals between their meals. To enable them to support the waste of their strength, their stomachs should be constantly, but moderately stimulated by aliment, and this is best done by their eating four or five times in a day during the seasons of great bodily exertion. The food at this time should be *solid*, consisting chiefly of salted meat. The vegetables used with it, should possess some activity, or they should be made savoury by a mixture of spices. Onions and garlic are of a most cordial nature. They composed a part of the diet which enabled the Israelites to endure, in a warm climate, the heavy tasks imposed upon them by their Egyptian masters; and they were eaten, Horace and Virgil tell us, by the Roman farmers, to repair the waste of their strength, by the toils of harvest. There are likewise certain sweet substances, which support the body under the pressure of labour. The negroes in the West-Indies become strong, and even fat, by drinking the juice of the sugar cane, in the season of grinding it. The Jewish soldiers were invigorated by occasionally eating raisins and figs. A bread composed of wheat flour, molasses, and ginger (commonly called gingerbread), taken in small quantities during the day, is happily calculated to obviate the debility induced upon the body by constant labour. All these sub-

stances, whether of an animal or vegetable nature, lessen the desire, as well as the necessity, for cordial drinks, and impart equable and durable strength to every part of the system.

2. Valetudinarians, especially those who are afflicted with diseases of the stomach and bowels, are very apt to seek relief from ardent spirits. Let such people be cautious how they make use of this dangerous remedy. I have known many men and women of excellent characters and principles, who have been betrayed, by occasional doses of gin and brandy, into a love of those liquors, and have afterwards fallen sacrifices to their fatal effects. The different preparations of opium are much more safe and efficacious than distilled cordials of any kind, in flatulent or spasmodic affections of the stomach and bowels. So great is the danger of contracting a love for distilled liquors, by accustoming the stomach to their stimulus, that as few medicines as possible should be given in spiritous vehicles, in chronic diseases. A physician, of great eminence and uncommon worth, who died towards the close of the last century, in London, in taking leave of a young physician of this city, who had finished his studies under his patronage, impressed this caution with peculiar force upon him, and lamented at the same time, in pathetic terms, that he had innocent,

ly made many sots, by prescribing brandy and water in stomach complaints. It is difficult to tell how many persons have been destroyed by those physicians who have adopted Dr. Brown's indiscriminate practice in the use of stimulating remedies, the most popular of which is ardent spirits, but, it is well known, several of them have died of intemperance in this city, since the year 1790. They were probably led to it, by drinking brandy and water, to relieve themselves from the frequent attacks of debility and indisposition, to which the labours of a physician expose him, and for which rest, fasting, a gentle purge, or weak diluting drinks would have been safe and more certain cures.

None of these remarks are intended to preclude the use of spirits in the low state of short, or what are called acute diseases, for, in such cases, they produce their effects too soon to create a habitual desire for them.

3. Some people, from living in countries subject to intermitting fevers, endeavour to fortify themselves against them, by taking two or three wine-glasses of bitters, made with spirits, every day. There is great danger of contracting habits of intemperance from this practice. Besides, this

mode of preventing intermittents is far from being a certain one. A much better security against them, is a tea-spoonful of the jesuits bark, taken every morning during a sickly season. If this safe and excellent medicine cannot be had, a gill or half a pint of a strong watery infusion of centaury, camomile, wormwood, or rue, mixed with a little of the calamus of our meadows, may be taken every morning, with nearly the same advantage as the jesuits bark. Those persons who live in a sickly country, and cannot procure any of the preventives of autumnal fevers which have been mentioned, should avoid the morning and evening air; should kindle fires in their houses, on damp days, and in cool evenings, throughout the whole summer; and put on winter clothes, about the first week in September. The last part of these directions applies only to the inhabitants of the middle states.

4. Men who follow professions, which require constant exercise of the faculties of their minds, are very apt to seek relief, by the use of ardent spirits, from the fatigue which succeeds great mental exertions. To such persons, it may be a discovery to know, that TEA is a much better remedy for that purpose. By its grateful and gentle stimulus, it removes fatigue, restores the excitement of the mind, and invigorates the whole system. I am

no advocate for the excessive use of tea. When taken too strong, it is hurtful, especially to the female constitution; but when taken of a moderate degree of strength, and in moderate quantities, with sugar and cream, or milk, I believe it is, in general, innoxious, and at all times to be preferred to ardent spirits, as a cordial for studious men. The late Anthony Benezet, one of the most laborious schoolmasters I ever knew, informed me, he had been prevented from the love of spiritous liquors, by acquiring a love for tea in early life. Three or four cups, taken in an afternoon, carried off the fatigue of a whole day's labour in his school. This worthy man lived to be seventy-one years of age, and died of an acute disease, with the full exercise of all the faculties of his mind. But the use of tea counteracts a desire for distilled spirits, during great *bodily*, as well as mental exertions. Of this, Captain Forest has furnished us with a recent and remarkable proof, in his History of a Voyage from Calcutta, to the Marqui Archipelago. "I have always observed (says this ingenious mariner) when sailors drink TEA, it weans them from the thoughts of drinking strong liquors, and pernicious grog; and with this, they are soon contented. Not so with whatever will intoxicate, be it what it will. This has always been my remark. I therefore always encourage it, without their knowing why."

5. Women have sometimes been led to seek relief from what is called breeding sickness, by the use of ardent spirits. A little gingerbread, or biscuit, taken occasionally, so as to prevent the stomach being empty, is a much better remedy for that disease.

6. Persons under the pressure of debt, disappointments in worldly pursuits, and guilt, have sometimes sought to drown their sorrows in strong drink. The only radical cure for those evils, is to be found in religion; but where its support is not resorted to, wine and opium should always be preferred to ardent spirits. They are far less injurious to the body and mind, than spirits, and the habits of attachment to them are easily broken, after time and repentance have removed the evils they were taken to relieve.

7. The sociable and imitative nature of man, often disposes him to adopt the most odious and destructive practices from his companions. The French soldiers who conquered Holland, in the year 1794, brought back with them the love and use of brandy, and thereby corrupted the inhabitants of several of the departments of France, who had been previously distinguished for their temperate and sober manners. Many other facts might

be mentioned, to show how important it is to avoid the company of persons addicted to the use of ardent spirits.

8. Smoking and chewing tobacco, by rendering water and simple liquors insipid to the taste, dispose very much to the stronger stimulus of ardent spirits. The practice of smoking segars has, in every part of our country, been more followed by a general use of brandy and water, as a common drink, more especially by that class of citizens who have not been in the habit of drinking wine, or malt liquors. The less, therefore, tobacco is used in the above ways, the better.

9. No man ever became suddenly a drunkard. It is by gradually accustoming the taste and stomach to ardent spirits, in the forms of GROG and TODDY, that men have been led to love them in their more destructive mixtures, and in their simple state. Under the impression of this truth, were it possible for me to speak with a voice so loud as to be heard from the river St. Croix to the remotest shores of the Mississippi, which bound the territory of the United States, I would say, Friends and fellow-citizens, avoid the habitual use of those two seducing liquors, whether they be made with brandy, rum, gin, Jamaica spirits, whis-

key, or what is called cherry bounce. It is true, some men, by limiting the strength of those drinks, by measuring the spirit and water, have drunken them for many years, and even during a long life, without acquiring habits of intemperance or intoxication, but many more have been insensibly led, by drinking weak toddy and grog first at their meals, to take them for their constant drink, in the intervals of their meals; afterwards to take them, of an increased strength, before breakfast in the morning; and finally to destroy themselves by drinking undiluted spirits, during every hour of the day and night. I am not singular in this remark. "The consequences of drinking rum and water, or *grog*, as it is called (says Dr. Moseley), is, that habit increases the desire of more spirits, and decreases its effects; and there are very few grog-drinkers who long survive the practice of debauching with it, without acquiring the odious nuisance of dram-drinkers' breath, and downright stupidity and impotence*." To enforce the caution against the use of those two apparently innocent and popular liquors still further, I shall select one instance, from among many, to show the ordinary manner in which they beguile and destroy their votaries. A citizen of Philadelphia, once of a fair

* Treatise on Tropical Diseases.

and sober character, drank toddy for many years, as his constant drink. From this he proceeded to drink grog. After a while, nothing would satisfy him but slings made of equal parts of rum and water, with a little sugar. From slings he advanced to raw rum, and from common rum to Jamaica spirits. Here he rested for a few months, but at length, finding even Jamaica spirits were not strong enough to warm his stomach, he made it a constant practice to throw a table-spoonful of ground pepper in each glass of his spirits, in order, to use his own words, "to take off their coldness." He soon after died a martyr to his intemperance.

Ministers of the gospel, of every denomination, in the United States! aid me with all the weight you possess in society, from the dignity and usefulness of your sacred office, to save our fellow men from being destroyed, by the great destroyer of their lives and souls. In order more successfully to effect this purpose, permit me to suggest to you to employ the same wise modes of instruction, which you use in your attempts to prevent their destruction by other vices. You expose the evils of covetousness, in order to prevent theft; you point out the sinfulness of impure desires, in order to prevent adultery; and you dissuade from anger, and malice, in order to prevent murder. In

like manner, denounce, by your preaching, conversation, and examples, the seducing influence of toddy and grog, when you aim to prevent all the crimes and miseries, which are the offspring of strong drink.

We have hitherto considered the effects of ardent spirits upon individuals, and the means of preventing them. I shall close this head of our inquiry, by a few remarks on their effects upon the population and welfare of our country, and the means of obviating them.

It is highly probable, not less than 4000 people die annually, from the use of ardent spirits, in the United States. Should they continue to exert this deadly influence upon our population, where will their evils terminate? This question may be answered, by asking, where are all the Indian tribes, whose numbers and arms formerly spread terror among their civilized neighbours? I answer, in the words of the famous Mingo chief, "the blood of many of them flows not in the veins of any human creature." They have perished, not by pestilence, nor war, but by a greater foe to human life than either of them—ardent spirits. The loss of 4000 American citizens, by the yellow fever, in a single year, awakened general sympathy

and terror, and called forth all the strength and ingenuity of laws, to prevent its recurrence. Why is not the same zeal manifested in protecting our citizens from the more general and consuming ravages of distilled spirits? Should the customs of civilized life, preserve our nation from extinction, and even from an increase of mortality, by those liquors; they cannot prevent our country being governed by men, chosen by intemperate and corrupted voters. From such legislators, the republic would soon be in danger. To avert this evil, let good men of every class unite and besiege the general and state governments, with petitions to limit the number of taverns; to impose heavy duties upon ardent spirits; to inflict a mark of disgrace, or a temporary abridgment of some civil right, upon every man convicted of drunkenness; and finally to secure the property of habitual drunkards, for the benefit of their families, by placing it in the hands of trustees, appointed for that purpose, by a court of justice.

To aid the operation of these laws, would it not be extremely useful for the rulers of the different denominations of christian churches to unite, and render the sale and consumption of ardent spirits, a subject of ecclesiastical jurisdiction? The methodists, and society of friends, have, for

some time past, viewed them as contraband articles, to the pure laws of the gospel, and have borne many public and private testimonies, against making them the objects of commerce. Their success in this benevolent enterprise, affords ample encouragement for all other religious societies to follow their example.

AN INQUIRY, &c.

PART III.

WE come now to the third part of this inquiry, that is, to mention the remedies for the evils which are brought on by the excessive use of distilled spirits.

These remedies divide themselve into two kinds.

I. Such as are proper to cure a fit of drunkenness, and

II. Such as are proper to prevent its recurrence, and to destroy a desire for ardent spirits.

I. I am aware that the efforts of science and humanity, in applying their resources to the cure of a disease, induced by an act of vice, will meet with a cold reception from many people. But let such people remember, the subjects of our remedies, are their fellow creatures, and that the miseries brought upon human nature, by its crimes, are as much the objects of divine compassion (which we are bound to imitate), as the distresses which are brought upon men, by the crimes of other people, or which they bring upon themselves, by ignorance or accidents. Let us not then, pass by the prostrate sufferer from strong drink, but administer to him the same relief, we would afford to a fellow creature, in a similar state, from an accidental, and innocent cause.

1. The first thing to be done to cure a fit of drunkenness, is to open the collar, if in a man, and remove all tight ligatures from every other part of the body. The head and shoulders should at the same time be elevated, so as to favour a more feeble determination of the blood to the brain.

2. The contents of the stomach should be discharged, by thrusting a feather down the throat. It often restores the patient immediately to his senses and feet. Should it fail of exciting a puking,

3. A napkin should be wrapped round the head, and wetted for an hour or two with cold water, or cold water should be poured in a stream upon the head. In the latter way, I have sometimes seen it used, when a boy, in the city of Philadelphia. It was applied, by dragging the patient, when found drunk in the street, to a pump, and pumping water upon his head for ten or fifteen minutes. The patient generally rose, and walked off, sober and sullen, after the use of this remedy.

Other remedies, less common, but not less effectual for a fit of drunkenness, are,

4. Plunging the whole body into cold water. A number of gentlemen who had drunken to intoxication, on board a ship in the stream, near Fell's point, at Baltimore, in consequence of their reeling in a small boat, on their way to the shore, in the evening, overset it, and fell into the water. Several boats from the shore hurried to their relief. They were all picked up, and went home, perfectly sober, to their families.

5. Terror. A number of young merchants, who had drunken together, in a compting-house, on James river, above thirty years ago, until they were intoxicated, were carried away by a sudden rise of

the river, from an immense fall of rain. They floated several miles with the current, in their little cabin, half filled with water. An island in the river arrested it. When they reached the shore that saved their lives, they were all sober. It is probable terror assisted in the cure of the persons who fell into the water at Baltimore.

6. The excitement of a fit of anger. The late Dr. Witherspoon used to tell a story of a man in Scotland, who was always cured of a fit of drunkenness, by being made angry. The means chosen for that purpose, was a singular one. It was talking against religion.

7. A severe whipping. This remedy acts by exciting a revulsion of the blood from the brain, to the external parts of the body.

8. Profuse sweats. By means of this evacuation, nature sometimes cures a fit of drunkenness. Their good effects are obvious in labourers, whom quarts of spirits taken in a day, will seldom intoxicate, while they sweat freely. If the patient be unable to swallow warm drinks, in order to produce sweats, they may be excited by putting him in a warm bath, or wrapping his body in blankets, un-

der which should be placed half a dozen hot bricks, or bottles filled with hot water.

9. Bleeding. This remedy should always be used, when the former ones have been prescribed to no purpose, or where there is reason to fear from the long duration of the disease, a material injury may be done to the brain.

It is hardly necessary to add, that each of the above remedies, should be regulated by the grade of drunkenness, and the greater or less degree, in which the intellects are affected in it.

II. The remedies which are proper to prevent the recurrence of fits of drunkenness, and to destroy the desire for ardent spirits, are religious, metaphysical, and medical. I shall briefly mention them.

1. Many hundred drunkards have been cured of their desire for ardent spirits, by a practical belief in the doctrines of the christian religion. Examples of the divine efficacy of christianity for this purpose, have lately occurred in many parts of the United States.

2. A sudden sense of the guilt contracted by drunkenness, and of its punishment in a future

world. It once cured a gentleman in Philadelphia, who, in a fit of drunkenness, attempted to murder a wife whom he loved. Upon being told of it when he was sober, he was so struck with the enormity of the crime he had nearly committed, that he never tasted spiritous liquors afterwards.

3. A sudden sense of shame. Of the efficacy of this deep seated principle in the human bosom, in curing drunkenness, I shall relate three remarkable instances.

A farmer in England, who had been many years in the practice of coming home intoxicated, from a market town, one day observed appearances of rain, while he was in market. His hay was cut, and ready to be housed. To save it, he returned in haste to his farm, before he had taken his customary dose of grog. Upon coming into his house, one of his children, a boy of six years old, ran to his mother, and cried out, "O, mother! father is come home, and he is not drunk." The father, who heard this exclamation, was so severely rebuked by it, that he suddenly became a sober man.

A noted drunkard was once followed by a favourite goat, to a tavern, into which he was invited by

his master, and drenched with some of his liquor. The poor animal staggered home with his master, a good deal intoxicated. The next day he followed him to his accustomed tavern. When the goat came to the door, he paused: his master made signs to him to follow him into the house. The goat stood still. An attempt was made to thrust him into the tavern. He resisted, as if struck with the recollection of what he suffered from being intoxicated the night before. His master was so much affected by a sense of shame in observing the conduct of his goat to be so much more rational than his own, that he ceased from that time to drink spiritous liquors.

A gentleman, in one of the southern states, who had nearly destroyed himself by strong drink, was remarkable for exhibiting the grossest marks of folly in his fits of intoxication. One evening, sitting in his parlour, he heard an uncommon noise in his kitchen. He went to the door, and peeped through the key hole, from whence he saw one of his negroes diverting his fellow servants, by mimicking his master's gestures and conversation when he was drunk. The sight overwhelmed him with shame and distress, and instantly became the means of his reformation.

4. The association of the idea of ardent spirits, with a painful or disagreeable impression upon some part of the body, has sometimes cured the love of strong drink. I once tempted a negro man, who was habitually fond of ardent spirits, to drink some rum (which I placed in his way), and in which I had put a few grains of tartar emetic. The tartar sickened and puked him to such a degree, that he supposed himself to be poisoned. I was much gratified by observing he could not bear the sight, nor smell of spirits, for two years afterwards.

I have heard of a man, who was cured of the love of spirits, by working off a puke, by large draughts of brandy and water, and I know a gentleman, who in consequence of being affected with a rheumatism, immediately after drinking some toddy, when overcome with fatigue and exposure to the rain, has ever since loathed that liquor, only because it was accidentally associated in his memory with the recollection of the pain he suffered from his disease.

This appeal to that operation of the human mind, which obliges it to associate ideas, accidentally or otherwise combined, for the cure of vice, is very ancient. It was resorted to by Moses, when he compelled the children of Israel to drink the solution of the golden calf (which they had idolized) in

water. This solution, if made, as it most probably was, by means of what is called hepar sulphuris, was extremely bitter, and nauseous, and could never be recollected afterwards, without bringing into equal detestation, the sin which subjected them to the necessity of drinking it. Our knowledge of this principle of association upon the minds and conduct of men, should lead us to destroy, by means of other impressions, the influence of all those circumstances, with which the recollection and desire of spirits are combined. Some men drink only in the *morning*, some at *noon*, and some only at *night*. Some men drink only on a *market day*, some at *one* tavern only, and some only in *one kind* of company. Now by finding a new and interesting employment, or subject of conversation for drunkards at the usual times in which they have been accustomed to drink, and by restraining them by the same means from those places and companions, which suggested to them the idea of ardent spirits, their habits of intemperance may be completely destroyed. In the same way the periodical returns of appetite, and a desire of sleep have been destroyed in a hundred instances. The desire for strong drink differs from each of them, in being of an artificial nature, and therefore not disposed to return, after being chased for a few week from the system.

5. The love of ardent spirits has sometimes been subdued, by exciting a counter passion in the mind. A citizen of Philadelphia had made many unsuccessful attempts to cure his wife of drunkenness. At length, despairing of her reformation, he purchased a hogshead of rum, and, after tapping it, left the key in the door of the room in which it was placed, as if he had forgotten it. His design was to give his wife an opportunity of drinking herself to death. She suspected this to be his motive, in what he had done, and suddenly left off drinking. Resentment here became the antidote to intemperance.

6. A diet consisting wholly of vegetables cured a physician in Maryland, of drunkenness, probably by lessening that thirst, which is always more or less excited by animal food.

7. Blisters to the ankles, which were followed by an unusual degree of inflammation, once suspended the love of ardent spirits, for one month, in a lady in this city. The degrees of her intemperance may be conceived of, when I add, that her grocer's accompt for brandy alone amounted, annually, to one hundred pounds, Pennsylvania currency, for several years.

8. A violent attack of an acute disease, has sometimes destroyed a habit of drinking distilled liquors. I attended a notorious drunkard, in the yellow fever, in the year 1798, who recovered with the loss of his relish for spirits, which has, I believe, continued ever since.

9. A salivation has lately performed a cure of drunkenness, in a person of Virginia. The new disease excited in the mouth and throat, while it rendered the action of the smallest quantity of spirits upon them painful, was happily calculated to destroy the disease in the stomach which prompts to drinking, as well as to render the recollection of them disagreeable, by the laws of association formerly mentioned.

10. I have known an oath, taken before a magistrate, to drink no more spirits, produce a perfect cure of drunkenness. It is sometimes cured in this way in Ireland. Persons who take oaths for this purpose are called affidavit men.

11. An advantage would probably arise from frequent representations being made to drunkards, not only of the certainty, but of the *suddenness* of death, from habits of intemperance. I have heard of two persons being cured of the love of ardent

spirits, by seeing death suddenly induced by fits of intoxication; in the one case, in a stranger, and in the other, in an intimate friend.

12. It has been said, that the disuse of spirits should be gradual, but my observations authorize me to say, that persons who have been addicted to them, should abstain from them *suddenly*, and *entirely*. "Taste not, handle not, touch not," should be inscribed upon every vessel that contains spirits, in the house of a man who wishes to be cured of habits of intemperance. To obviate, for a while, the debility which arises from the sudden abstraction of the stimulus of spirits, laudanum, or bitters infused in water, should be taken, and perhaps a larger quantity of beer or wine, that is consistent with the strict rules of temperate living. By the temporary use of these substitutes for spirits, I have never known the transition to sober habits to be attended with any bad effects, but often with permanent health of body, and peace of mind.

OBSERVATIONS

ON THE

DUTIES OF A PHYSICIAN,

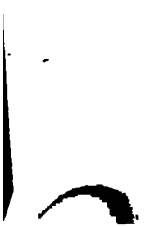
AND THE METHODS OF

IMPROVING MEDICINE.

ACCOMMODATED TO THE PRESENT STATE OF SOCIETY AND MANNERS IN THE UNITED STATES.

Delivered in the University of Pennsylvania, February 7, 1789, at the conclusion of a course of lectures upon chemistry and the practice of physic.

PUBLISHED AT THE REQUEST OF THE CLASS.



OBSERVATIONS, &c.

GENTLEMEN,

I SHALL conclude our course of lectures, by delivering to you a few directions for the regulation of your future conduct and studies, in the line of your profession.

I shall, *first*, suggest the most probable means of establishing yourselves in business, and of becoming acceptable to your patients, and respectable in life.

Secondly, I shall mention a few thoughts which have occurred to me on the mode to be pursued, in the further prosecution of your studies, and for the improvement of medicine.

I. Permit me, in the first place, to recommend to such of you as intend to settle in the country, to establish yourselves as early as possible upon *farms*. My reasons for this advice are as follow:

1. It will reconcile the country people to the liberality and dignity of your profession, by showing them that you assume no superiority over them from your education, and that you intend to share with them in those toils, which were imposed upon man in consequence of the loss of his innocence. This will prevent envy, and render you acceptable to your patients as men, as well as physicians.

2. By living on a farm you may serve your country, by promoting improvements in agriculture. Chemistry (which is now an important branch of a medical education) and agriculture are closely allied to each other. Hence some of the most useful books upon agriculture have been written by physicians. Witness the essays of Dr. Home of Edinburgh, and of Dr. Hunter of Yorkshire, in England.

3. The business of a farm will furnish you with employment in the healthy seasons of the year, and thereby deliver you from the tædium vitæ, or what is worse, from retreating to low or improper com-

pany. Perhaps one cause of the prevalence of dram or grog drinking, with which country practitioners are sometimes charged, is owing to their having no regular or profitable business to employ them, in the intervals of their attendance upon their patients.

4. The resources of a farm will create such an independence as will enable you to practice with more dignity, and at the same time screen you from the trouble of performing unnecessary services to your patients. It will change the nature of the obligation between you and them. While *money* is the only means of your subsistence, your patients will feel that they are the channels of your daily bread; but while your farm furnishes you with the necessaries of life, your patients will feel more sensibly, that the obligation is on their side, for health and life.

5. The exigencies and wants of a farm in *stock* and *labour* of all kinds, will enable you to obtain from your patients a compensation for your services in those articles. They all possess them, and men part with that of which money is only the sign, much more readily than they do with money itself.

6. The resources of a farm will prevent your cherishing, for a moment, an impious wish for the prevalence of sickness in your neighbourhood. A healthy season will enable you to add to the produce of your farm, while the rewards of an unhealthy season will enable you to repair the inconvenience of your necessary absence from it. By these means your pursuits will be marked by that *variety* and *integrity*, in which true happiness is said to consist.

7. Let your farms be small, and let your *principal* attention be directed to grass and horticulture. These afford most amusement, require only moderate labour, and will interfere least with your duties to your profession.

II. Avoid singularities of every kind in your manners, dress, and general conduct. Sir Isaac Newton, it is said, could not be distinguished in company, by any peculiarity, from a common well-bred gentleman. Singularity in any thing, is a substitute for such great or useful qualities as command respect; and hence we find it chiefly in little minds. The profane and indelicate combination of extravagant ideas, improperly called wit, and the formal and pompous manner, whether accompanied by a wig, a cane, or a ring, should be all

avoided, as incompatible with the simplicity of science, and the real dignity of physic. There is more than one way of playing the quack. It is not necessary, for this purpose, that a man should advertise his skill, or his cures, or that he should mount a phaeton and display his dexterity in operating, to an ignorant and gaping multitude. A physician acts the same part in a different way, who assumes the character of a madman or a brute in his manners, or who conceals his fallibility by an affected gravity and taciturnity in his intercourse with his patients. Both characters, like the quack, impose upon the public. It is true, they deceive different ranks of people; but we must remember that there are two kinds of vulgar, viz. the rich and the poor; and that the rich vulgar are often upon a footing with the poor, in ignorance and credulity.

III. It has been objected to our profession, that many eminent physicians have been unfriendly to christianity. If this be true, I cannot help ascribing it in part to that neglect of public worship with which the duties of our profession are often incompatible; for it has been justly observed, that the neglect of this religious and social duty, generally produces a relaxation, either in principles or morals. Let this fact lead you, in setting out in

business, to acquire such habits of punctuality in visiting your patients, as shall not interfere with acts of public homage to the Supreme Being. Dr. Gregory has observed, that a cold heart is the most frequent cause of deism. Where this occurs in a physician, it affords a presumption that he is deficient in humanity. But I cannot admit that infidelity is peculiar to our profession. On the contrary, I believe christianity places among its friends more men of extensive abilities and learning in medicine, than in any other secular employment. Stahl, Hoffman, Boerhaave, Sydenham, Haller, and Fothergill, were all christians. These enlightened physicians were considered as the ornaments of the ages in which they lived, and posterity has justly ranked them among the greatest benefactors of mankind.

IV. Permit me to recommend to you a regard to all the interests of your country. The education of a physician gives him a peculiar insight in the principles of many useful arts, and the practice of physic favours his opportunities of doing good, by diffusing knowledge of all kinds. It was in Rome, when medicine was practised only by slaves, that physicians were condemned by their profession "mutam exercere artem." But in modern times, and in free governments, they should

disdain an ignoble silence upon public subjects. The American revolution has rescued physic from its former slavish rank in society. For the honour of our profession it should be recorded, that some of the most intelligent and useful characters, both in the cabinet and the field, during the late war, have been physicians. The illustrious Dr. Fothergill opposed faction and tyranny, and took the lead in all public improvements in his native country, without suffering thereby the least diminution of that reputation, or business, in which, for forty years, he flourished almost without a rival in the city of London.

V. Let me advise you, in your visits to the sick, *never* to appear in a hurry, nor to talk of indifferent matters before you have made the necessary inquiries into the symptoms of your patient's disease.

VI. Avoid making light of any case. "Respice finem" should be the motto of every indisposition. There is scarcely a disease so trifling, that has not, directly or indirectly, proved an outlet to human life. This consideration should make you anxious and punctual in your attendance upon every acute disease, and keep you from risking your reputation by an improper or hasty prognosis.

VII. Do not condemn, or oppose, unnecessarily, the simple prescriptions of your patients. Yield to them in matters of little consequence, but maintain an inflexible authority over them in matters that are essential to life.

VIII. Preserve, upon all occasions, a composed or cheerful countenance in the room of your patients, and inspire as much hope of a recovery as you can, consistent with truth, especially in acute diseases. The extent of the influence of the will over the human body, has not yet been fully ascertained. I reject the futile pretensions of Mr. Mesmer to the cure of diseases, by what he has absurdly called animal magnetism. But I am willing to derive the same advantages from his deceptions, which the chemists have derived from the delusions of the alchemists. The facts which he has established, clearly prove the influence of the imagination, and will, upon diseases. Let us avail ourselves of the handle which those faculties of the mind present to us, in the strife between life and death. I have frequently prescribed remedies of doubtful efficacy in the critical stage of acute diseases, but never till I had worked up my patients into a confidence, bordering upon certainty, of their probable good effects. The success of this measure has much oftener answered, than disap-

pointed my expectations; and while my patients have commended the vomit, the purge, or the blister which was prescribed, I have been disposed to attribute their recovery to the vigorous concurrence of the *will* in the action of the medicine. Does the will beget insensibility to cold, heat, hunger, and danger? Does it suspend pain, and raise the body above feeling the pangs of Indian tortures? Let us not then be surprised that it should enable the system to resolve a spasm, to open an obstruction, or to discharge an offending humour. I have only time to hint at this subject. Perhaps it would lead us, if we could trace it fully, to some very important discoveries in the cure of diseases.

IX. Permit me to advise you in your intercourse with your patients, to attend to that principle in the human mind, which constitutes the association of ideas. A chamber, a chair, a curtain, or even a cup, all belong to the means of life or death, accordingly as they are associated with cheerful or distressing ideas, in the mind of a patient. But this principle is of more immediate application in those chronic diseases which affect the mind. Nothing can be accomplished here, till we produce a new association of ideas. For this purpose a change of place and company are absolutely ne-

cessary. But we must sometimes proceed much further. I have heard of a gentleman in South-Carolina who cured his fits of low spirits by changing his clothes. The remedy was a rational one. It produced at once a new train of ideas, and thus removed the paroxysm of his disease.

X. Make it a rule never to be angry at any thing a sick man says or does to you. Sickness often adds to the natural irritability of the temper. We are, therefore, to bear the reproaches of our patients with meekness and silence. It is folly to resent injuries at any time, but it is cowardice to resent an injury from a sick man, since, from his weakness and dependence upon us, he is unable to contend with us upon equal terms. You will find it difficult to attach your patients to you by the obligations of friendship or gratitude. You will sometimes have the mortification of being deserted by those patients who owe most to your skill and humanity. This led Dr. Turner to advise physicians never to chuse their friends from among their patients. But this advice can never be followed by a heart that has been taught to love true excellency, wherever it finds it. I would rather advise you to give the benevolent feelings of your hearts full scope, and to forget the unkind returns

they will often meet with, by giving to human nature——a tear.

XI. Avoid giving a patient over in an acute disease. It is impossible to tell in such cases where life ends, and where death begins. Hundreds of patients have recovered, who have been pronounced incurable, to the great disgrace of our profession. I know that the practice of predicting danger and death upon every occasion, is sometimes made use of by physicians, in order to enhance the credit of their prescriptions if their patients recover, and to secure a retreat from blame, if they should die. But this mode of acting is mean and illiberal. It is not necessary that we should decide with confidence at any time, upon the issue of a disease.

XII. A physician in sickness is always a welcome visitor in a family; hence he is often solicited to partake of the usual sign of hospitality in this country, by taking a draught of some strong liquor, every time he enters into the house of a patient. Let me charge you to lay an early restraint upon yourselves, by refusing to yield to this practice, especially in the *forenoon*. Many physicians have been innocently led by it into habits of drunkenness. You will be in the more danger

of falling into this vice, from the great fatigue and inclemency of the weather to which you will be exposed in country practice. But you have been taught that strong drink affords only a temporary relief from those evils, and that it afterwards renders the body more sensible of them.

XIII. I shall now give some directions with respect to the method of charging for your services to your patients.

When we consider the expence of a medical education, and the sacrifices a physician is obliged to make of ease, society, and even health, to his profession; and when we add to these, the constant and painful anxiety which is connected with the important charge of the lives of our fellow-creatures, and above all, the inestimable value of that blessing which is the object of his services, I hardly know how it is possible for a patient sufficiently and justly to reward his physician. But when we consider, on the other hand, that sickness deprives men of the means of acquiring money; that it increases all the expenses of living; and that high charges often drive patients from regular-bred physicians to quacks; I say, when we attend to these considerations, we should make

our charges as moderate as possible, and conform them to the following state of things.

Avoid measuring your services to your patients by scruples, drachms, and ounces. It is an illiberal mode of charging. On the contrary, let the number and *time* of your visits, the nature of your patient's disease, and his rank in his family or society, determine the figures in your accounts. It is certainly just to charge more for curing an apoplexy, than an intermitting fever. It is equally just, to demand more for risking your life by visiting a patient in a contagious fever, than for curing a pleurisy. You have likewise a right to be paid for your anxiety. Charge the same services, therefore, higher, to the master or mistress of a family, or to an only son or daughter, who call forth all your feelings and industry, than to less important members of a family and of society. If a rich man demand more frequent visits than are necessary, and if he impose the restraints of keeping to hours, by calling in other physicians to consult with you upon every trifling occasion, it will be just to make him pay accordingly for it. As this mode of charging is strictly agreeable to reason and equity, it seldom fails of according with the reason and sense of equity of our patients. Accounts made out upon these principles, are seldom complained

of by them. I shall only remark further upon this subject, that the sooner you send in your accounts after your patients recover, the better. It is the duty of a physician to inform his patient of the amount of his obligation to him at least *once* a year. But there are times when a departure from this rule may be necessary. An unexpected misfortune in business, and a variety of other accidents, may deprive a patient of the money he had allotted to pay his physician. In this case, delicacy and humanity require, that he should not know the amount of his debt to his physician, till time had bettered his circumstances.

I shall only add, under this head, that the poor of every description should be the objects of your peculiar care. Dr. Boerhaave used to say, "they "were his best patients, because God was their "paymaster." The first physicians that I have known, have found the poor the steps by which they have ascended to business and reputation. Diseases among the lower class of people are generally simple, and exhibit to a physician the best cases of all epidemics, which cannot fail of adding to his ability of curing the complicated diseases of the rich and intemperate. There is an inseparable connection between a man's duty and his interest. Whenever you are called, therefore, to visit a poor

patient, imagine you hear the voice of the good Samaritan sounding in your ears, "Take care of "him, and I will repay thee."

I come now to the second part of this address, which was to point out the best mode to be pursued, in the further prosecution of your studies, and the improvement of medicine.

I. Give me leave to recommend to you, to open all the dead bodies you can, without doing violence to the feelings of your patients, or the prejudices of the common people. Preserve a register of the weather, and of its influence upon the vegetable productions of the year. Above all, record the epidemics of every season; their times of appearing and disappearing, and the connection of the weather with each of them. Such records, if published, will be useful to foreigners, and a treasure to posterity. Preserve, likewise, an account of chronic cases. Record the name, age, and occupation of your patient; describe his disease accurately, and the changes produced in it by your remedies; mention the doses of every medicine you administer to him. It is impossible to tell how much improvement and facility in practice you will find from following these directions. It has been remarked, that physicians seldom remember

more than the two or three last years of their practice. The records which have been mentioned, will supply this deficiency of memory, especially in that advanced stage of life when the advice of physicians is supposed to be most valuable.

II. Permit me to recommend to you further, the study of the anatomy (if I may be allowed the expression) of the human mind, commonly called metaphysics. The reciprocal influence of the body and mind upon each other, can only be ascertained by an accurate knowledge of the faculties of the mind, and of their various modes of combination and action. It is the duty of physicians to assert their prerogative, and to rescue the mental science from the usurpations of schoolmen and divines. It can only be perfected by the aid and discoveries of medicine. The authors I would recommend to you upon metaphysics, are, Butler, Locke, Hartley, Reid, and Beattie. These ingenious writers have cleared this sublime science of its technical rubbish, and rendered it both intelligible and useful.

III. Let me remind you, that improvement in medicine is not to be derived only from colleges and universities. Systems of physic are the productions of men of genius and learning; but those facts which constitute real knowledge, are to be

met with in every walk of life. Remember how many of our most useful remedies have been discovered by quacks. Do not be afraid, therefore, of conversing with them, and of profiting by their ignorance and temerity in the practice of physic. Medicine has its Pharisees, as well as religion. But the spirit of this sect is as unfriendly to the advancement of medicine, as it is to christian charity. By conversing with quacks, we may convey instruction to them, and thereby lessen the mischief they might otherwise do to society. But further. In the pursuit of medical knowledge, let me advise you to converse with nurses and old women. They will often suggest facts in the history and cure of diseases, which have escaped the most sagacious observers of nature. Even negroes and Indians have sometimes stumbled upon discoveries in medicine. Be not ashamed to inquire into them. There is yet one more means of information in medicine which should not be neglected, and that is, to converse with persons who have recovered from indispositions without the aid of physicians. Examine the strength and exertions of nature in these cases, and mark the plain and home-made remedy to which they ascribe their recovery. I have found this to be a fruitful source of instruction, and have been led to conclude, that if every man in a city, or a district, could

be called upon to relate to persons appointed to receive and publish his narrative, an exact account of the effects of those remedies which accident or whim has suggested to him, it would furnish a very useful book in medicine. To preserve the facts thus obtained, let me advise you to record them in a book to be kept for that purpose. There is one more advantage that will probably attend the inquiries that have been mentioned: you may discover diseases, or symptoms of diseases, or even laws of the animal economy, which have no place in our systems of nosology, or in our theories of physic.

IV. Study simplicity in the preparation of your medicines. My reasons for this advice are as follow:

1. Active medicines produce the most certain effects in a simple state.

2. Medicines when mixed frequently destroy the efficacy of each other. I do not include chemical medicines alone in this remark. It applies likewise to Galenical medicines. I do not say, that all these medicines are impaired by mixture, but we can only determine when they are not, by actual experiments and observations.

3. When medicines of the same class, or even of different classes, are given together, the *strongest* only produces an effect. But what are we to say to a compound of two medicines which give exactly the same impression to the system? Probably, if we are to judge from analogy, the effect of them will be such as would have been produced by neither, in a simple state.

4. By observing simplicity in your prescriptions, you will always have the command of a greater number of medicines of the *same* class, which may be used in succession to each other, in proportion as habit renders the system insensible of their action.

5. By using medicines in a simple state you will obtain an exact knowledge of their virtues and doses, and thereby be able to decide upon the numerous and contradictory accounts which exist in our books, of the character of the *same* medicines.

Under this head, I cannot help adding two more directions.

1. Avoid sacrificing too much to the *taste* of your patients in the preparation of your medicines. The nature of a medicine may be wholly changed by being mixed with sweet substances. The Au-

thor of Nature seems to have had a design, in rendering medicines unpalatable. Had they been more agreeable to the taste, they would probably have yielded long ago to the unbounded appetite of man, and by becoming articles of diet, or condiments, have lost their efficacy in diseases.

2. Give as few medicines as possible in tinctures made with distilled spirits. Perhaps there are few cases in which it is safe to exhibit medicines prepared in spirits, in any other form than in *drops*. Many people have been innocently seduced into a love of strong drink, from taking large or frequent doses of bitters, infused in spirits. Let not our profession be reproached in a single instance, with adding to the calamities that have been entailed upon mankind by this dreadful species of intemperance.

V. Let me recommend to your particular attention, the indigenous medicines of our country. Cultivate or prepare as many of them as possible, and endeavour to enlarge the materia medica, by exploring the untrodden fields and forests of the United States. The ipecacuanha, the Seneka and Virginia snake-roots, the Carolina pink-root, the spice-wood, the sassafras, the butter-nut, the thoroughwort, the poke, and the stramonium, are

but a small part of the medicinal productions of America. I have no doubt but there are many hundred other plants which now exhale invaluable medicinal virtues in the desert air. Examine, likewise, the mineral waters, which are so various in their impregnation, and so common in all parts of our country. Let not the properties of the insects of America escape your investigation. We have already discovered among some of them, a fly equal in its blistering qualities to the famous fly of Spain. Who knows but it may be reserved for America to furnish the world, from her productions, with cures for some of those diseases which now elude the power of medicine? Who knows but that, at the foot of the Allegany mountain, there blooms a flower that is an infallible cure for the epilepsy? Perhaps on the Monongahela, or the Potowmac, there may grow a root that shall supply, by its tonic powers, the invigorating effects of the savage or military life in the cure of consumptions. Human misery of every kind is evidently on the decline. Happiness, like truth, is a unit. While the world, from the progress of intellectual, moral, and political truth, is becoming a more safe and agreeable abode for man, the votaries of medicine should not be idle. All the doors and windows of the temple of nature have been thrown open by the convulsions of the late

American revolution. This is the time, therefore, to press upon her altars. We have already drawn from them discoveries in morals, philosophy, and government; all of which have human happiness for their object. Let us preserve the unity of truth and happiness, by drawing from the same source, in the present critical moment, a knowledge of antidotes to those diseases which are supposed to be incurable.

I have now, gentlemen, only to thank you for the attention with which you have honoured the course of lectures which has been delivered to you, and to assure you, that I shall be happy in rendering you all the services that lie in my power, in any way you are pleased to command me. Accept of my best wishes for your happiness, and may the blessings of hundreds and thousands that were ready to perish, be your portion in life, your comfort in death, and your reward in the world to come.

AN

INQUIRY INTO THE CAUSE AND CURE

OF

SORE LEGS.

AN INQUIRY, &c.

HOWEVER trifling these complaints may appear, they compose a large class of the diseases of a numerous body of people. Hitherto, the persons afflicted by them have been too generally abandoned to the care of empirics, either because the disease was considered as beneath the notice of physicians, or because they were unable to cure it. I would rather ascribe it to the latter, than to the former cause, for pride has no natural fellowship with the profession of medicine.

The difficulty of curing sore legs has been confessed by physicians in every country. As far as my observations have extended, I am disposed to ascribe this difficulty to the uniform and indiscriminate mode of treating them, occasioned by the want of a theory which shall explain their proxi-

mate cause. I shall attempt in a few pages to deliver one, which, however imperfect, will, I hope, lay a foundation for more successful inquiries upon this subject hereafter.

I shall begin my observations upon this disease, by delivering and supporting the following propositions.

I. SORE LEGS are induced by general debility. This I infer from the occupations and habits of the persons who are most subject to them. They are day-labourers, and sailors, who are in the habit of lifting great weights; also washer-women, and all other persons, who pass the greatest part of their time upon their feet. The blood-vessels and muscular fibres of the legs are thus overstretched, by which means either a rupture, or such a languid action in the vessels is induced, as that an accidental wound from any cause, even from the scratch of a pin, or the bite of a mosquito, will not easily heal. But labourers, sailors, and washer-women are not the only persons who are afflicted with sore legs. Hard drinkers of every rank and description are likewise subject to them. Where strong drink, labour, and standing long on the feet are united, they more certainly dispose to sore legs, than when they act separately. In China, where

the labour which is performed by brutes in other countries, is performed by men, varices on the legs are very common among the labouring people. Perhaps, the reason why the debility is induced in the legs produces varices instead of ulcers in these people, may be owing to their not adding the debilitating stimulus of strong drink to that of excessive labour.

It is not extraordinary that the debility produced by intemperance in drinking ardent spirits, should appear first in the lower extremities. The debility produced by intemperance in the use of wine, makes its first appearance in the form of gout, in the same part of the body. The gout, it is true, discovers itself most frequently in pain only, but there are cases in which it has terminated in ulcers, and even mortifications on the legs.

II. Sore legs are connected with a morbid state of the whole system. This I infer,

1. From the causes which induce them, all of which act more or less upon every part of the body.

2. From their following or preceding diseases, which obviously belong to the whole system. Fevers and dysenteries often terminate critically in

this disease; and the pulmonary consumption and apoplexy have often been preceded by the suppression of a habitual discharge from a sore leg. The two latter diseases have been ascribed to the translation of a morbific matter to the lungs or brain: but it is more rational to ascribe them to a previous debility in those organs, by which means their vessels were more easily excited into action and effusion by the stimulus of the plethora, induced upon the system in consequence of the confinement of the fluids formerly discharged from the leg in the form of pus. This plethora can do harm only where there is previous debility; for I maintain that the system (when the solids are exactly toned) will always relieve itself of a sudden preternatural accumulation of fluids by means of some natural emunctory. This has been often observed in the menorrhagia, which accompanies plentiful living in women, and in the copious discharges from the bowels and kidneys, which follow a suppression of the perspiration.

3. I infer it, from their appearing almost universally in one disease, which is evidently a disease of the whole system, viz. the scurvy.

4. From their becoming in some cases the outlets of menstrual blood, which is discharged in con-

sequence of a plethora, which affects more or less every part of the female system.

5. I infer it from the *symptoms* of sore legs, which are in some cases febrile, and affect the pulse in every part of the body with preternatural frequency or force. These symptoms were witnessed, in an eminent degree, in two of the patients who furnished subjects for clinical remarks in the Pennsylvania hospital some years ago.

6. I infer that sore legs are a disease of the whole system, from the manner in which they are sometimes cured by nature and art. They often prove the outlets of many general diseases, and all the remedies which cure them, act more or less upon the whole system.

In all cases of sore legs there is a tonic and atonic state of the whole system. The same state of excessive or weak morbid action takes place in the parts which are affected by the sores. The remedies to cure them, therefore, should be *general* and *local*.

In cases where the arterial system is affected by too much tone, the general remedies should be,

I. BLOOD-LETTING. Of the efficacy of this remedy in disposing ulcers suddenly to heal, the two clinical patients before-mentioned exhibited remarkable proofs, in the presence of all the students of medicine in the university. The blood drawn was sizy in both cases. I have not the merit of having introduced this remedy into practice in the cure of ulcers. I learned it from Sir John Pringle. I have known it to be used with equal success in a sore breast, attended by pain and inflammation, after all the usual remedies in that disease had been used to no purpose.

II. GENTLE PURGES.

III. NITRE. From fifteen to twenty grains of this medicine should be given three times a-day.

IV. A TEMPERATE DIET, and a total abstinence from fermented and distilled liquors.

V. COOL and PURE AIR.

VI. Rest in a recumbent posture of the body.

The *local* remedies in this state of the system should be,

I. Cold water. Dr. Rigby has written largely in favour of this remedy when applied to local inflammations. From its good effects in allaying the inflammation which sometimes follows the puncture which is made in the arm in communicating the small-pox, and from the sudden relief it affords in the inflammatory state of the ophthalmia and in the piles, no one can doubt of its efficacy in sore legs, accompanied by inflammation in those vessels, which are the immediate seat of the disease.

II. Soft poultices of bread and milk, or of bread moistened with lead water. Dr. Underwood's method of making a poultice of bread and milk should be preferred in this case. He directs us first to boil the milk, then to powder the bread, and throw it into the milk, and after they have been intimately mixed, by being well stirred and boiled together, they should be poured out and spread upon a rag, and a knife dipped in sweet oil or lard, should be run over them. The solidity and consistence of the poultice is hereby better preserved, than when the oil or lard is mixed with the bread and milk over the fire.

III. When the inflammation subsides, adhesive plasters so applied as to draw the sound edges of the sores together. This remedy has been used

with great success by Dr. Physick, in the Pennsylvania hospital, and in his private practice.

IV. Above all, rest, and a horizontal posture of the leg. Too much cannot be said in favour of this remedy in this species of sore legs. Nannoni, the famous Italian surgeon, sums up the cure of sore legs in three words, viz. "Tempo, riposo, "e pazienza;" that is, in time, rest, and patience. A friend of mine, who was cured by this surgeon of a sore leg, many years ago, informed me, that he confined him to his bed during the greatest part of the time that he was under his care.

In sore legs, attended by too little general and local action, the following remedies are proper.

I. BARK. It should be used plentifully, but with a constant reference to the state of the system; for the changes in the weather, and other accidental circumstances, often produce such changes in the system, as to render its disuse for a short time frequently necessary.

II. MERCURY. This remedy has been supposed to act by altering the fluids, or by discharging a morbid matter from them, in curing sore legs. But this is by no means the case. It appears to act as

a universal stimulant; and if it prove most useful when it excites a salivation, it is only because in this way it excites the most general action in the system.

III. MINERAL TONICS, such as the different preparations of iron, copper, and zinc.

IV. GENTLE EXERCISE. Rest, and a recumbent posture of the body, so proper in the tonic, are both hurtful in this species of sore legs. The efficacy of exercise, even of the active kind, in the cure of sore legs, accompanied by deficient action in the vessels, may easily be conceived from its good effects after gun-shot wounds which are mentioned by Dr. Jackson*. He tells us, that those British soldiers who had been wounded at the battle of Guilford, in North-Carolina, who were turned out of the military hospitals and followed the army, soonest recovered of their wounds. It was remarkable, that if they delayed only a few days on the road, their wounds grew worse, or ceased to heal.

In the use of the different species of exercise, the same regard should be had to the state of

* Medical Journal, 1790.

the system, which has been recommended in other diseases.

V. A nutritious and moderately stimulating diet, consisting of milk, saccharine vegetables, animal food, malt liquors, and wine.

Wort has done great service in sore legs. The manner in which I have directed it to be prepared and taken is as follows: To three or four heaped table-spoonsful of the malt, finely powdered and sifted, add two table-spoonsful of brown sugar, and three or four of Madeira, sherry, or Lisbon wine, and a quart of boiling water. After they have stood a few hours, it may be drunken liberally by the patient, stirring it each time before he takes it, so that the whole substance of the malt may be conveyed into the stomach. A little lime-juice may be added, if the patient requires it, to make it more pleasant. The above quantity may be taken once, twice, or three times a-day at the pleasure of the patient, or according to the indication of his disease.

VI. Opium. This remedy is not only useful in easing the pain of a sore leg, but co-operates with other cordial medicines in invigorating the whole system.

The *local* applications should consist of such substances as are gently escarotic, and which excite an action in the torpid vessels of the affected part. Arsenic, precipitate, and blue vitriol, have all been employed with success for this purpose. Dr. Griffitts informed me, that he has frequently accomplished the same thing in the Dispensary by applications of tartar emetic. They should all be used, if necessary, in succession to each other; for there is often the same idiosyncrasy in a sore leg to certain topical applications, that there is in the stomach to certain aliments. After the use of these remedies, astringents and tonics should be applied, such as an infusion of Peruvian, or white-oak bark; the water in which the smiths extinguish their irons, lime-water, bread dipped in a weak solution of green vitriol (so much commended by Dr. Underwood), compresses wetted with brandy, or ardent spirits of any kind, and, above all, the adhesive plasters formerly mentioned.

Tight bandages are likewise highly proper here. The laced stocking has been much used. It is made of strong coarse linen. Dr. Underwood gives several good reasons for preferring a flannel roller to the linen stocking. It sets easier on the leg, and yields to the swelling of the muscles in walking.

In scorbutic sores on the legs, navy surgeons have spoken in high terms of an application of a mixture of lime-juice and molasses. Mr. Gillespie commends the use of lime or lemon-juice alone, and ascribes many cures to it in the British navy during the late war, after every common application had been used to no purpose*.

It is of the utmost consequence in the treatment of sore legs, to keep them clean, by frequent dressings and washings. The success of old women is oftener derived from their great attention to cleanliness, in the management of sore legs, than to any specifics they possess which are unknown to physicians.

When sore legs are kept from healing by affections of the bone, the treatment should be such as is recommended by practical writers on surgery.

I shall conclude this inquiry by four observations, which are naturally suggested by what has been delivered upon this disease.

1. If it has been proved that sore legs are connected with a morbid state of the whole system, is

* Medical Journal, Vol. VI.

it not proper to inquire, whether many other diseases supposed to be local, are not in like manner connected with the whole system; and if sore legs have been cured by general remedies, is it not proper to use them more frequently in local diseases?

2. If there be two states of action in the arteries in sore legs, it becomes us to inquire, whether the same opposite states of action do not take place in many diseases in which they are not suspected. It would be easy to prove, that they exist in several other local diseases.

3. If the efficacy of the remedies for sore legs which have been mentioned, depend upon their being accommodated exactly to the state of the arterial system, and if this system be liable to frequent changes, does it not become us to be more attentive to the state of the pulse in this disease than is commonly supposed to be necessary by physicians?

4. It has been a misfortune in medicine, as well as in other sciences, for men to ascribe effects to one cause, which should be ascribed to many. Hence diseases have been attributed exclusively to morbid affections of the fluids by some, and of the muscles and nerves by others. Unfortunately the

morbid states of the arterial system, and the influence of those states upon the brain, the nerves, the muscles, the lymphatics, the glands, the viscera, the alimentary canal, and the skin, as well as the reciprocal influence of the morbid states of each of those parts of the body upon the arteries, and upon each other, have been too much neglected in most of our systems of physic. I consider the pathology of the arterial system as a mine. It was first discovered by Dr. Cullen. The man who attempts to explore it, will probably impoverish himself by his researches; but the men who come after him, will certainly obtain from it a treasure which cannot fail of adding greatly to the riches of medicine.

AN ACCOUNT

OF THE

STATE OF THE BODY AND MIND

IN OLD AGE;

WITH

OBSERVATIONS ON ITS DISEASES,

AND THEIR REMEDIES.

AN ACCOUNT, &c.

MOST of the facts which I shall deliver upon this subject, are the result of observations made during the term of five years, upon persons of both sexes, who had passed the 80th year of their lives. I intended to have given a detail of the names, manner of life, occupations, and other circumstances of each of them; but, upon a review of my notes, I found so great a sameness in the history of most of them, that I despaired, by detailing them, of answering the intention which I have purposed in the following essay. I shall, therefore, only deliver the facts and principles which are the result of the inquiries and observations I have made upon this subject.

I. I shall mention the circumstances which favour the attainment of longevity.

II. I shall mention the phenomena of body and mind which attend it; and,

III. I shall enumerate its peculiar diseases, and the remedies which are most proper to remove, or moderate them.

I. The circumstances which favour longevity, are,

1. *Descent from long-lived ancestors.* I have not found a single instance of a person, who has lived to be 80 years old, in whom this was not the case. In some instances I found the descent was only from one, but, in general, it was from both parents. The knowledge of this fact may serve, not only to assist in calculating what are called the chances of lives, but it may be made useful to a physician. He may learn from it to cherish hopes of his patients in chronic, and in some acute diseases, in proportion to the capacity of life they have derived from their ancestors*.

* Dr. Franklin, who died in his 84th year, was descended from long-lived parents. His father died at 89, and his mother at 87. His father had 17 children by two wives. The doctor informed me, that he once sat down as one of 11 adult sons and daughters at his father's table. In an excursion he once made to that part of England from whence his

2. *Temperance in eating and drinking.* To this remark I found several exceptions. I met with one man of 84 years of age, who had been intemperate in eating; and four or five persons who had been intemperate in drinking ardent spirits. They had all been day-labourers, or had deferred drinking until they began to feel the languor of old age. I did not meet with a single person who had not, for the last forty or fifty years of their lives, used tea, coffee, and bread and butter twice a day as part of their diet. I am disposed to believe that those articles of diet do not materially affect the duration of human life, although they evidently impair the strength of the system. The duration of life does not appear to depend so much upon the strength of the body, or upon the quantity of its excitability, as upon an exact accommodation of stimuli to each of them. A watch spring will last as long as an anchor; provided the forces which are capable of destroying both, are always in an exact ratio to their strength. The use of tea and coffee in diet seems to be happily suited to the change which has taken place in the human body, by sedentary occupations, by which means less

family migrated to America, he discovered, in a grave-yard, the tomb-stones of several persons of his name, who had lived to be very old. These persons he supposed to have been his ancestors.

nourishment and stimulus are required than formerly, to support animal life.

3. The *moderate exercise of the understanding.* It has long been an established truth, that literary men (other circumstances being equal) are longer lived than other people. But it is not necessary that the understanding should be employed upon philosophical subjects to produce this influence upon human life. Business, politics, and religion, which are the objects of attention of men of all classes, impart a vigour to the understanding, which, by being conveyed to every part of the body, tends to produce health and long life.

4. *Equanimity of temper.* The violent and irregular action of the passions tends to wear away the springs of life.

Persons who live upon annuities in Europe have been observed to be longer lived, in equal circumstances, than other people. This is probably occasioned by their being exempted, by the certainty of their subsistence, from those fears of want which so frequently distract the minds, and thereby weaken the bodies of old people. Life-rents have been supposed to have the same influence in prolonging life. Perhaps the *desire of life*, in order to

enjoy for as long a time as possible, that property which cannot be enjoyed a second time by a child or relation, may be another cause of the longevity of persons who live upon certain incomes. It is a fact, that the desire of life is a very powerful stimulus in prolonging it, especially when that desire is supported by hope. This is obvious to physicians every day. Despair of recovery, is the beginning of death in all diseases.

But obvious and reasonable as the effects of equanimity of temper are upon human life, there are some exceptions in favour of passionate men and women having attained to a great age. The morbid stimulus of anger, in these cases, was probably obviated by less degrees, or less active exercises of the understanding, or by the defect or weakness of some of the other stimuli which keep up the motions of life.

5. *Matrimony.* In the course of my inquiries I met with only one person beyond eighty years of age who had never been married. I met with several women who had borne from ten to twenty children, and suckled them all. I met with one woman, a native of Herefordshire, in England, who was in the 100th year of her age, who had borne a child at 60, menstruated till 80, and frequently

suckled two of her children (though born in succession to each other) at the same time. She had passed the greatest part of her life over a washing-tub.

6. *Emigration.* I have observed many instances of Europeans who have arrived in America in the decline of life, who have acquired fresh vigour from the impression of our climate, and of new objects upon their bodies and minds; and whose lives, in consequence thereof, appeared to have been prolonged for many years. This influence of climate upon longevity is not confined to the United States. Of 100 European Spaniards, who emigrate to South-America in early life, 18 live to be above 50, whereas but 8 or 9 native Spaniards, and but 7 Indians of the same number, exceed the 50th year of human life.

7. I have not found *sedentary employments* to prevent long life, where they are not accompanied by intemperance in eating or drinking. This observation is not confined to literary men, nor to women only, in whom longevity, without much exercise of body, has been frequently observed. I met with one instance of a weaver; a second of a silver-smith; and a third of a shoe-maker, among

the number of old people, whose histories have suggested these observations.

8. I have not found that *acute*, nor that all *chronic* diseases shorten human life. Dr. Franklin had two successive vomicas in his lungs before he was 40 years old. I met with one man beyond 80, who had survived a most violent attack of the yellow fever; a second who had had several of his bones fractured by falls, and in frays; and many who had been frequently affected by intermittents. I met with one man of 86, who had all his life been subject to syncope; another who had for 50 years been occasionally affected by a cough*; and two instances of men who had been afflicted for forty years with obstinate head-achs†. I met with only one person beyond 80, who had ever been affected by a disease in the *stomach;* and in him it arose from an occasional rupture. Mr. John Strangeways Hutton, of this city, who died in 1793, in the 109th year of his age, informed me, that he

* This man's only remedy for his cough was the fine powder of dry Indian turnip and honey.

† Dr. Thiery says, that he did not find the itch, or slight degrees of the leprosy, to prevent longevity. Observations de Physique, et de Medecine faites en differens lieux de L'Espagne. Vol II. p. 171.

had never puked in his life. This circumstance is the more remarkable, as he passed several years at sea when a young man*. These facts may serve to extend our ideas of the importance of a healthy state of the stomach in the animal economy; and thereby to add to our knowledge in the prognosis of diseases, and in the chances of human life.

9. I have not found the *loss of teeth* to affect the duration of human life, so much as might be expected. Edward Drinker, who lived to be 103

* The venerable old man, whose history first suggested this remark, was born in New-York in the year 1684. His grandfather lived to be 101, but was unable to walk for thirty years before he died, from an excessive quantity of fat. His mother died at 91. His constant drinks were water, beer, and cyder. He had a fixed dislike to spirits of all kinds. His appetite was good, and he ate plentifully during the last years of his life. He seldom drank any thing between his meals. He was never intoxicated but twice in his life, and that was when a boy, and at sea, where he remembers perfectly well to have celebrated, by a feu de joye, the birth-day of queen Anne. He was formerly afflicted with the headach and giddiness, but never had a fever, except from the small-pox, in the course of his life. His pulse was slow, but regular. He had been twice married. By his first wife he had eight, and by his second seventeen children. One of them lived to be 83 years of age. He was about five feet nine inches in height, of a slender make, and carried an erect head to the last year of his life.

years old, lost his teeth thirty years before he died, from drawing the hot smoke of tobacco into his mouth through a short pipe.

Dr. Sayre of New-Jersey, to whom I am indebted for several very valuable histories of old persons, mentions one man aged 81, whose teeth began to decay at 16, and another of 90, who lost his teeth, thirty years before he saw him. The gums, by becoming hard, perform, in part, the office of teeth. But may not the gastric juice of the stomach, like the tears and urine, become acrid by age, and thereby supply, by a more dissolving power, the defect of mastication from the loss of teeth? Analogies might easily be adduced from several operations of nature, which go forward in the animal economy, which render this supposition highly probable.

10. I have not observed *baldness*, or *grey hairs*, occurring in early or middle life, to prevent old age. In one of the histories furnished me by Dr. Sayre, I find an account of a man of 81, whose hair began to assume a silver colour when he was but one and twenty years of age.

11. More women live to be old than men, but more men live to be *very* old, than women.

I shall conclude this head by the following remark:

Notwithstanding there appears in the human body a certain capacity of long life, which seems to dispose it to preserve its existence in every situation; yet this capacity does not always protect it from premature destruction; for among the old people whom I examined, I scarcely met with one who had not lost brothers or sisters, in early and middle life, and who were born under circumstances equally favourable to longevity with themselves.

II. I now come to mention some of the phenomena of the body and mind which occur in old age.

1. There is a great sensibility to *cold* in all old people. I met with an old woman of 84, who slept constantly under three blankets and a coverlet during the hottest summer months. The servant of prince de Beaufremont, who came from Mount Jura to Paris, at the age of 121, to pay his respects to the first national assembly of France, shivered with cold in the middle of the dog days, when he was not near a good fire. The national assembly directed him to sit with his hat on, in order to defend his head from the cold.

2. Impressions made upon the *ears* of old people, excite sensation and reflection much quicker than when they are made upon their eyes. Mr. Hutton informed me, that he had frequently met his sons in the street without knowing them, until they had spoken to him. Dr. Franklin informed me, that he recognized his friends, after a long absence from them, first by their voices. This fact does not contradict the common opinion, upon the subject of memory, for the recollection, in these instances, is the effect of what is called reminiscence, which differs from memory in being excited only by the renewal of the impression which at first produced the idea which is revived.

3. The *appetite* for food is generally increased in old age. The famous Parr, who died at 152, ate heartily in the last week of his life. The kindness of nature, in providing this last portion of earthly enjoyments for old people, deserves to be noticed. It is remarkable, that they have, like children, a frequent recurrence of appetite, and sustain with great uneasiness the intervals of regular meals. The observation, therefore, made by Hippocrates, that middle-aged people are more affected by abstinence than those who are old, is not true. This might easily be proved by many appeals to the records of medicine; but old people differ from

children, in preferring *solid* to liquid aliment. From inattention to this fact, Dr. Mead has done great mischief by advising old people, as their teeth decayed or perished, to lessen the quantity of their solid, and to increase the quantity of their liquid food. This advice is contrary to nature and experience, and I have heard of two old persons who destroyed themselves by following it. The circulation of the blood is supported in old people chiefly by the stimulus of aliment. The action of liquids of all kinds upon the system is weak, and of short continuance, compared with the durable stimulus of solid food. There is a gradation in the action of this food upon the body. Animal matters are preferred to vegetable; the fat of meat to the lean, and salted meat to fresh, by most old people. I have met with but few old people who retained an appetite for milk. It is remarkable, that a less quantity of *strong drink* produces intoxication in old people than in persons in the middle of life. This depends upon the recurrence of the same state of the system, with respect to excitability, which takes place in childhood. Many old people, from an ignorance of this fact, have made shipwreck of characters which have commanded respect in every previous stage of their lives. From the same recurrence of the excitability of childhood in their systems, they

commonly drink their tea and coffee much weaker than in early or middle life.

4. The *pulse* is generally full, and frequently affected by pauses in its pulsations when felt in the wrists of old people. A regular pulse in such persons indicates a disease, as it shows the system to be under the impression of a preternatural stimulus of some kind. This observation was suggested to me above thirty years ago by Morgagni, and I have often profited by it in attending old people. The pulse in such patients is an uncertain mark of the nature, or degree of an acute disease. It seldom partakes of the quickness or convulsive action of the arterial system, which attends fever in young or middle-aged people. I once attended a man of 77 in a fever of the bilious kind, which confined him for eight days to his bed, in whom I could not perceive the least quickness or morbid action in his pulse until four and twenty hours before he died.

5. The marks of old age appear earlier, and are more numerous in persons who have combined with hard labour, a vegetable or scanty diet, than in persons who have lived under opposite circumstances. I think I have observed these marks of old age to occur sooner, and to be more numerous in the German, than in the English or Irish citi-

zens of Pennsylvania. They are likewise more common among the inhabitants of country places, than of cities, and still more so among the Indians of North-America, than among the inhabitants of civilized countries.

6. Old men tread upon the *whole base* of their feet at once in *walking*. This is perhaps one reason why they wear out fewer shoes, under the same circumstances of constant use, than young people, who, by treading on the posterior, and rising on the anterior part of their feet, expose their shoes to more unequal pressure and friction. The advantage derived to old people from this mode of walking is very obvious. It lessens that disposition to totter, which is always connected with weakness: hence we find the same mode of walking is adopted by habitual drunkards, and is sometimes from habit practised by them, when they are not under the influence of strong drink.

7. The breath and perspiration of old people have a peculiar acrimony, and their urine, in some instances, emits a fœtor of an offensive nature.

8. The eyes of very old people sometimes change from a dark and blue, to a light colour.

9. The *memory* is the first faculty of the mind which fails in the decline of life. While recent events pass through the mind without leaving an impression upon it, it is remarkable that the long forgotten events of childhood and youth are recalled and distinctly remembered.

I met with a singular instance of a German woman, who had learned to speak the language of our country after she was forty years of age, who had forgotten every word of it after she had passed her 80th year, but spoke the German language as fluently as ever she had done. The memory decays soonest in hard drinkers. I have observed some studious men to suffer a decay of their memories, but never of their understandings. Among these was the late Anthony Benezet of this city. But even this infirmity did not abate the cheerfulness, nor lessen the happiness of this pious philosopher, for he once told me, when I was a young man, that he had a consolation in the decay of his memory, which gave him a great advantage over me. "You can read a good book (said he) with plea-"sure but *once*, but when I read a good book, I "so soon forget the contents of it, that I have the "pleasure of reading it over and over; and every "time I read it, it is alike new and delightful to "me." The celebrated Dr. Swift was one of

those few studious men, who have exhibited marks of a decay of understanding in old age; but it is judiciously ascribed by Dr. Johnson to two causes which rescue books, and the exercise of the thinking faculties from having had any share in inducing that disease upon his mind. These causes were, a rash vow which he made when a young man, never to use spectacles, and a sordid seclusion of himself from company, by which means he was cut off from the use of books, and the benefits of conversation, the absence of which left his mind without its usual stimulus: hence it collapsed into a state of fatuity. It is probably owing to the constant exercise of the understanding, that literary men possess that faculty of the mind in a vigorous state in extreme old age. The same cause accounts for old people preserving their intellects longer in cities, than in country places. They enjoy society upon such easy terms in the former situation, that their minds are kept more constantly in an excited state by the acquisition of new, or the renovation of old ideas, by means of conversation.

10. I did not meet with a single instance in which the moral or religious faculties were impaired in old people. I do not believe, that these faculties of the mind are preserved by any supernatural power, but wholly by the constant and increasing

exercise of them in the evening of life. In the course of my inquiries, I heard of a man of 101 years of age, who declared that he had forgotten every thing he had ever known, except his GOD. I found the moral faculty, or a disposition to do kind offices to be exquisitely sensible in several old people, in whom there was scarcely a trace left of memory or understanding.

11. Dreaming is universal among old people. It appears to be brought on by their imperfect sleep, of which I shall say more hereafter.

12. I mentioned formerly the sign of a *second childhood* in the state of the appetite in old people. It appears further, 1. In the marks which slight contusions or impressions leave upon their skins. 2. In their being soon fatigued by walking or exercise, and in being as soon refreshed by rest. 3. In their disposition, like children, to detail immediately every thing they see and hear. And, 4. In their aptitude to shed tears; hence they are unable to tell a story that is in any degree distressing without weeping. Dr. Moore takes notice of this peculiarity in Voltaire, after he had passed his 80th year. He wept constantly at the recital of his own tragedies. This feature in old age, did not escape Homer. Old Menelaus wept ten years af-

ter he returned from the destruction of Troy, when he spoke of the death of the heroes who perished before that city.

13. It would be sufficiently humbling to human nature, if our bodies exhibited in old age the marks only of a second childhood; but human weakness descends still lower. I met with an instance of a woman between 80 and 90, who exhibited the marks of a *second infancy*, by such a total decay of her mental faculties, as to lose all consciousness in discharging her alvine and urinary excretions. In this state of the body, a disposition to sleep, succeeds the wakefulness of the first stages of old age. Dr. Haller mentions an instance of a very old man who slept twenty, out of every twenty-four hours during the few last years of his life.

14. The disposition in the system to *renew* certain parts in extreme old age, has been mentioned by several authors. Many instances are to be met with in the records of medicine of the sight* and

* There is a remarkable instance of the sight having been restored after it had been totally destroyed in an old man near Reading, in Pennsylvania. My brother, Judge Rush, furnished me with the following account of him in a letter from Reading, dated June 23, 1792.

hearing having been restored, and even of the teeth having been renewed in old people a few years before death. These phenomena have led me to suspect that the antediluvian age was attained by the frequent renovation of different parts of the body, and that when they occur, they are an effort of the causes which support animal life, to produce antediluvian longevity, by acting upon the revived excitability of the system.

15. The *fear* of death appears to be much less in old age, than in early, or middle life. I met with many old people who spoke of their dissolution with composure, and with some who expres-

"An old man, of 84 years of age, of the name of Adam Riffle, near this town, gradually lost his sight in the 68th year of his age, and continued entirely blind for the space of twelve years. About four years ago his sight returned, without making use of any means for the purpose, and without any visible change in the appearance of the eyes, and he now sees as well as ever he did. I have seen the man, and have no doubt of the fact. He is at this time so hearty, as to be able to walk from his house to Reading (about three miles), which he frequently does in order to attend church. I should observe, that during both the gradual loss, and recovery of his sight, he was no ways affected by sickness, but, on the contrary, enjoyed his usual health. I have this account from his daughter and son-in-law, who live within a few doors of me."

sed earnest desires to lie down in the grave. This indifference to life, and desire for death (whether they arise from a satiety in worldly pursuits and pleasures, or from a desire of being relieved from pain) appear to be a wise law in the animal economy, and worthy of being classed with those laws which accommodate the body and mind of man to all the natural evils, to which, in the common order of things, they are necessarily exposed.

III. I come now briefly to enumerate the diseases of old age, and the remedies which are most proper to remove, or to mitigate them.

The diseases are chronic and acute. The CHRONIC are,

1. *Weakness* of the *knees* and *ancles*, a lessened ability to walk, and tremors in the head and limbs.

2. *Pains in the bones*, known among nosological writers by the name of rheumatalgia.

3. *Involuntary flow of tears*, and of mucus from the nose.

4. *Difficulty of breathing*, and a short *cough*, with copious expectoration. A weak, or hoarse voice generally attends this cough.

5. *Costiveness.*

6. An *inability to retain the urine* as long as in early or middle life. Few persons beyond 60 pass a whole night without being obliged to discharge their urine*. Perhaps the stimulus of this liquor in the bladder may be one cause of the universality of dreaming among old people. It is certainly a frequent cause of dreaming in persons in early and middle life: this I infer, from its occuring chiefly in the morning when the bladder is most distended with urine. There is likewise an inability in old people to discharge their urine as quickly as in early life. I think I have observed this to be among the first symptoms of the declension of the strength of the body by age.

7. *Wakefulness.* This is probably produced in part by the action of the urine upon the bladder; but such is the excitability of the system in the first stages of old age, that there is no pain so light, no anxiety so trifling, and no sound so small, as not to produce wakefulness in old people. It is owing to their imperfect sleep, that they are sometimes as

* I met with an old man, who informed me, that if from any accident he retained his urine after he felt an inclination to discharge it, he was affected by a numbness, accompanied by an uneasy sensation in the palms of his hands.

unconscious of the moment of their passsing from a sleeping to a waking state, as young and middle-aged people are of the moment in which they pass from the waking to a sleeping state. Hence we so often hear them complain of passing sleepless nights. This is no doubt frequently the case, but I am satisfied, from the result of an inquiry made upon this subject, that they often sleep without knowing it, and that their complaints in the morning, of the want of sleep, arise from ignorance, without the least intention to deceive.

8. *Giddiness.*

9. *Deafness.*

10. *Imperfect vision.*

The acute diseases most common among old people, are,

1. *Inflammation of the eyes.*

2. The *pneumonia notha*, or bastard peripneumony.

3. The *colic.*

4. *Palsy* and *apoplexy.*

5. The *piles.*

6. A *difficulty* in *making water.*

7. *Quartan fever.*

All the diseases of old people, both chronic and acute, originate in predisposing debility. The remedies for the former, where a feeble morbid action takes place in the system, are stimulants. The first of these is,

I. HEAT. The ancient Romans prolonged life by retiring to Naples, as soon as they felt the infirmities of age coming upon them. The aged Portuguese imitate them, by approaching the warm sun of Brazil, in South-America. But heat may be applied to the torpid bodies of old people artificially. 1st. By means of the *warm bath.* Dr. Franklin owed much of the cheerfulness and general vigour of body and mind which characterised his old age, to his regular use of this remedy. It disposed him to sleep, and even produced a respite from the pain of the stone, with which he was afflicted during the last years of his life.

2. Heat may be applied to the bodies of old people by means of *stove rooms*. The late Dr. Dewit, of Germantown, who lived to be near 100 years of age, seldom breathed an air below 72°, after he became an old man. He lived constantly in a stove-room.

3. WARM CLOTHING, more especially warm bed-clothes, are proper to preserve or increase the heat of old people. From the neglect of the latter, they are often found dead in their beds in the morning, after a cold night, in all cold countries. The late Dr. Chovet, of this city, who lived to be 85, slept in a baize night-gown, under eight blankets, and a coverlet, in a stove-room, many years before he died. The head should be defended in old people, by means of woollen, or fur caps, in the night, and by wigs and hats during the day, in cold weather. These artificial coverings will be the more necessary, where the head has been deprived of its natural covering. Great pains should be taken likewise to keep the feet dry and warm, by means of thick shoes*. To these modes of applying and

* I met with one man above 80, who defended his feet from moisture by covering his shoes in wet weather with melted wax; and another who, for the same purpose, covered his shoes every morning with a mixture composed of the following ingredients melted together: lintseed oil a

confining heat to the bodies of old people, a young bed-fellow has been added; but I conceive the three artificial modes which have been recommended, will be sufficient without the use of one, which cannot be successfully employed without a breach of delicacy or humanity.

II. To keep up the action of the system, GENEROUS DIET and DRINKS should be given to old people. For a reason mentioned formerly, they should be indulged in eating between the ordinary meals of families. Wine should be given to them in moderation. It has been emphatically called the milk of old age.

III. YOUNG COMPANY should be preferred by old people to the company of persons of their own age. I think I have observed old people to enjoy better health and spirits, when they have passed

pound, mutton suet eight ounces, bees-wax six ounces, and rosin four ounces. The mixture should be moderately warmed, and then applied not only to the upper leather, but to the soles of the shoes. This composition, the old gentleman informed me, was extracted from a book entitled, "The Complete Fisherman," published in England, in the reign of queen Elizabeth. He had used it for twenty years in cold and wet weather, with great benefit, and several of his friends, who had tried it, spoke of its efficacy in keeping the feet dry, in high terms.

the evening of their lives in the families of their children, where they have been surrounded by grand-children, than when they lived by themselves. Even the solicitude they feel for the welfare of their descendants, contributes to invigorate the circulation of the blood, and thereby to add fuel to the lamp of life.

IV. GENTLE EXERCISE. This is of great consequence in promoting the health of old people. It should be moderate, regular, and always in fair weather.

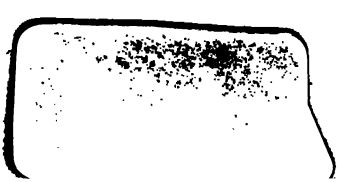
V. CLEANLINESS. This should by no means be neglected. The dress of old people should not only be clean, but more elegant than in youth or middle life. It serves to divert the eye of spectators from observing the decay and deformity of the body, to view and admire that which is always agreeable to it.

VI. To abate the pains of the chronic rheumatism, and the uneasiness of the old man's cough (as it is called); also to remove wakefulness, and to restrain, during the night, a troublesome inclination to make water, OPIUM may be given with great advantage. Chardin informs us, that this medicine is frequently used in the eastern countries

to abate the pains and weaknesses of old age, by those people who are debarred the use of wine by the religion of Mahomet.

I have nothing to say upon the acute diseases of old people, but what is to be found in most of our books of medicine, except to recommend BLEEDING in those of them which are attended with plethora, and an inflammatory action in the pulse. The degrees of appetite which belong to old age, the quality of the food taken, and the sedentary life which is generally connected with it, all concur to produce that state of the system, which requires the above evacuation. I am sure that I have seen many of the chronic complaints of old people mitigated by it, and I have more than once seen it used with obvious advantage in their inflammatory diseases. These affections I have observed to be more fatal among old people than is generally supposed. An inflammation of the lungs, which terminated in an abscess, deprived the world of Dr. Franklin. Dr. Chovet died of an inflammation in his liver. The blood drawn from him a few days before his death was sizy, and such was the heat of his body, produced by his fever, that he could not bear more covering (notwithstanding his former habits of warm clothing) than a sheet in the month of January.

Death from old age is the effect of a gradual palsy. It shows itself first in the eyes and ears, in the decay of sight and hearing; it appears next in the urinary bladder, in the limbs and trunk of the body; then in the sphincters of the bladder and rectum; and finally in the nerves and brain, destroying in the last, the exercise of all the faculties of the mind.

Few persons appear to die of old age. Some one of the diseases which have been mentioned, generally cuts the last thread of life.

END OF VOLUME I.